Lead Author Last Name	Lead Author First Name & MI	Other Authors	Item Title	Journal/Book Title	Publisher	ISBN/ISSN	Chapter or Volume	Edition/Issue (volume may be in column to left)	Pages	Publication Date	Keywords	Annotation (2-3 sentences about item significance)	Item submitted by (name/phone/email)
Addy	Edward A.		Performing Verification and Validation in Architecture-Based Software Engineering	CrossTalk The Journal of Defense Software Engineering	Software Technology Support Center			Vol.12, No. 9	32	Sep-99	verification, validation	This article describes a framework that extends verification and validation (V&V) from an individual application system to a product line of systems that are developed within an architecture-based software engineering environment.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Aeschliman	Daniel P	Oberkampf, William L.	Experimental Methodology for Computational Fluid Dynamics Code Validation	AIAA Journal			SAND99-0677			1999		Abstract: Validation of computational fluid dynamics (CFD) codes is an essential element of the code development process. Typically, CFD code validation is accomplished through comparison of computed results to previously published experimental data that were obtained for some other purpose, unrelated to code validation. As a result, it is a near certainty that not all of the information required by the code, particularly the boundary conditions, will be available. The common approach is, therefore, unsatisfactory, and a different method is required. A methodology is described that was developed specifically for experimental validation of CFD codes. The methodology requires teamwork and cooperation between code developers and experimentalists throughout the validation process and takes advantage of certain synergisms between CFD and experiment. The methodology employs a novel uncertainty analysis technique, which helps to define the experimental plan for code validation wind tunnel experiments and to distinguish between and quantify various types of experimental error. The	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
AIAA			Guide for the Verification and Validation of Computational Fluid Dynamics Simulations	AIAA Journal						April 1998 v. 2.5 (DRAFT)		Abstract: The document presents guidelines for assessing the credibility of modeling and simulation in computational fluid dynamics. The two main principles that are necessary for credibility are verification and validation. Verification is the process of determining if a computational simulation accurately represents the conceptual model, but no claim is made of the relationship of the simulation to the real world. Validation is the process of determining if a computational simulation represents the real world. This document defines a number of key terms, discusses fundamental concepts, and specifies general procedures for conducting verification and validation of computational fluid dynamics simulations. The document's goal is to provide a foundation for the major issues and concepts in verification and validation. However, this document does not recommend standards in these areas because a number of important issues are not yet resolved. It is hoped that the guidelines will aid in the research, development, and use of computational fluid dynamics simulations by establis	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Alessandrini	Stephen M.	William DiCecca, Jerry Golub, and Bettina Schechter	Matching Model Fidelity With Simulation Goals For Anti-Air Warfare Systems		Proceedings of the 1992 Summer Computer Simulation Conference in Reno, Nevada, pp. 169-173					1992			From Old DMSO VV&A Bibliography:
Anderson	Randy T.	Perry Y. Li	MATHEMATICAL MODELING OF A TWO SPOOL FLOW CONTROL SERVOVALVE USING A PRESSURE CONTROL PILOT 1	ASME Symposium on Modeling and Control Electrohydraulic Systems, Orlando, FL., November, 2000; http://www.me.umn.edu/~pli/papers/AndersonLilMECE2000.pdf (accessed August 2002).	American Society of Mechanical Engineers (ASME)					2000	experimental validation	A nonlinear dynamic model for an unconventional, commercially available electrohydraulic flow control servovalve is presented. The valve is a two-stage valve and differs from the conventional servovalve in that it does not require a feedback wire and ball, and the boost stage uses two spools, instead of a single spool, to meter flow into and out of the valve separately. Consequently, the valve is significantly less expensive. The proposed model captures the nonlinear and dynamic effects not present in previous models. The model has been coded in Simulink and experimentally validated.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu

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Aristotle				Prior and Posterior Analytics	Oxford University Press					1949		Defines logic and basic ideas of validation	Stevenson/864-656-5880/steve@cs.clemson.edu
Arlund	Ronald W.	Geri Lentz	Live, Virtual, and the Path to Data Correlation	Proceedings of the 2002 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Organziation					Mar. 10-15, 2002	VV&A, legacy simulation, live test, data correlation, operator-in-the-loop, output validation, system of systems, Joint Integrated Air Defense System, JIADS, cruise missile defense	This paper outlines the process developed by the Joint Cruise Missile Defense (JCMD) Joint Test Force (JTF) to use data from field tests employing actual combat systems, in the validation of a legacy simulation federation. The objective of these efforts is to ensure the models used for the Joint Test and Evaluation (JT&E) simulation events are credible for analyzing cruise missile defense in a joint environment	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Arnold	Phil		Modeling and Simulation Science and Engineering Team		Naval Air Warfare Center Briefing to Naval Aviation S&T Board					1993			From Old DMSO VV&A Bibliography:
Arthur	James D	Nance, Richard E	Independent Verification and Validation: A Missing Link in Simulation Methodology?	Proceedings	1996 Winter Simulation Conference		23		1263-1274	1996		Abstract: Independent verification and validation (IV&V) is a powerful tool that can be used to mitigate the increasing complexities associated with an ever-expanding set of modeling and simulation problems. In this paper we discuss the use of independent V&V within the modeling and simulation community. Literature reviews and conversations with experienced technical managers serve as a basis for our conjecture that (a) validation is the major focus of most modeling and simulation efforts, (b) verification plays only a secondary role, and (c) independent V&V is, for all practical purposes, being ignored. In an effort to raise the awareness of the benefits and applicability of independent V&V within the modeling and simulation community, we describe in a step-by-step fashion the application of independent V&V to one particular life cycle model of a simulation model.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Aust	Sarah	CDR Charles Frye and Scott Dunlap	A Web-Enabled Resource Center Provides Structure And Simulation Reusability	Proceedings of the 2002 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Organziation					Mar. 10-15, 2002	Process models, simulation, interoperability, verification, validation, tools	This paper describes an approach for improving decision support capability through discrete event simulation and web-enabled technology. The standard methodology incorporated and lessons learned described in this paper will be beneficial to any organization attempting to build and validate simulation-based decision support capability in today's dynamic environment.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Ayel	Marc		SACCO and SYCOJET: Two Ways for Verifying Knowledge-Base Systems		Proceedings of the First Workshop on "Validation, Verification and Test of KBS", ECAI90 (Stockholm)					1990			From Old DMSO VV&A Bibliography:
Ayel	Marc		Validation and Verification of non Classical Software	http://www.univ-savoie.fr/labos/lia/V&Vslides.pdf; accessed 7 April 2002									Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Ayel	Marc	and Jean-Pierre Laurent (eds)	Validation, Verification and Test of Knowledge-Based Systems		John Wiley & Sons (New York). ISBN 0471930180					1991			From Old DMSO VV&A Bibliography:
Bacon	Francis			Novum Organum	P. C. Collier					1902		Basis of the scientific method	Stevenson/864-656-5880/steve@cs.clemson.edu
Bailey	Michael P.	and William G. Kemple	The Scientific Method of Choosing Model Fidelity		Proceedings of the 1992 Winter Simulation Conference in Arlington, VA					1992			From Old DMSO VV&A Bibliography:
Balci	Osman	Robin J. Adams, David S. Myers, and Richard E. Nance	A Collaborative Evaluation Environment for Credibility Assessment of Modeling and Simulation Applications	Proceedings of the 2002 Winter Simulation Conference	IEEE, Piscataway, NJ					2002			Osman Balci/540-231-4841/balci@vt.edu
Balci	Osman		A Methodology for Certification of Modeling and Simulation Applications	ACM Transactions on Modeling and Computer Simulation	ACM					to appear.			Osman Balci/540-231-4841/balci@vt.edu

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Balci	Osman		A Methodology for Certification of Modeling and Simulation Applications	ACM Transactions on Modeling and Computer Simulation	ACM		Vol. 11, No. 4 (Oct.)		352-377	2001			Osman Balci/540-231-4841/balci@vt.edu
Balci	Osman	Robert G. Sargent	A Methodology for Cost-Risk Analysis in the Statistical Validation of Simulation Models	Communications of the ACM	ACM			Vol. 24, No. 4 (Apr.)	190-197	1981			Osman Balci/540-231-4841/balci@vt.edu
Balci	Osman		Credibility Assessment of Simulation Results: The State of the Art	Simulation Series	Society for Computer Simulation (SCS)			Vol. 19, No. 1 (Jan.)	19-25	1988			Osman Balci/540-231-4841/balci@vt.edu
Balci	Osman	Richard E. Nance, James D. Arthur, and William F. Ormsby	Expanding Our Horizons in VV&A Research and Practice	Technical Report, Dept. of Computer Science	Virginia Tech					2001			Osman Balci/540-231-4841/balci@vt.edu
Balci	Osman	Richard E. Nance, James D. Arthur, and William F. Ormsby	Expanding Our Horizons in VV&A Research and Practice	Proceedings of the 2002 Winter Simulation Conference	IEEE, Piscataway, NJ					2002			Osman Balci/540-231-4841/balci@vt.edu
Balci	Osman	Richard E. Nance	Formulated Problem Verification as an Explicit Requirement of Model Credibility	Simulation	Society for Computer Simulation (SCS)			Vol. 45, No. 2 (Aug.)	76-86	1985			Osman Balci/540-231-4841/balci@vt.edu
Balci	Osman		How to Assess the Acceptability and Credibility of Simulation Results	Proceedings of the 1989 Winter Simulation Conference (Washington, DC, Dec. 4-6)	IEEE, Piscataway, NJ				62-71	1989			Osman Balci/540-231-4841/balci@vt.edu
Balci	Osman	William F. Ormsby, John T. Carr, III, and Said D. Saadi	Planning for Verification, Validation, and Accreditation of Modeling and Simulation Applications	Proceedings of the 2000 Winter Simulation Conference (Orlando, FL, Dec. 10-13, 2000)	IEEE, Piscataway, NJ				829-839	2000			Osman Balci/540-231-4841/balci@vt.edu
Balci	Osman		Principles of Simulation Model Validation, Verification, and Testing	Transactions of the Society for Computer Simulation International	Society for Computer Simulation (SCS)			Vol. 14, No. 1	3-12	1997			Osman Balci/540-231-4841/balci@vt.edu
Balci	Osman	Said D. Saadi	Proposed Standard Processes for Certification of Modeling and Simulation Applications	Proceedings of the 2002 Winter Simulation Conference	IEEE, Piscataway, NJ					2002			Osman Balci/540-231-4841/balci@vt.edu
Balci	Osman	Robert G. Sargent	Validation of Multivariate Response Models Using Hotelling's Two-Sample T2 Test	Simulation	Society for Computer Simulation (SCS)			Vol. 39, No. 6 (Dec.)	185-192	1982			Osman Balci/540-231-4841/balci@vt.edu
Balci	Osman	Robert G. Sargent	Validation of Simulation Models via Simultaneous Confidence Intervals	American Journal of Mathematical and Management Sciences				Vol. 4, Nos. 3 & 4	375-406	1984			Osman Balci/540-231-4841/balci@vt.edu
Balci	Osman		Verification, Validation and Testing of Models	In Encyclopedia of Operations Research and Management Science (S. I. Glass and C. M. Harris, editors)	Kluwer Academic Publishers, Norwell, MA			Centennial Edition	870-878	2001			Osman Balci/540-231-4841/balci@vt.edu
Balci	Osman		Verification, Validation, and Accreditation	Proceedings of the 1998 Winter Simulation Conference (Washington, DC, Dec. 13-16, 1998)	IEEE, Piscataway, NJ				41-48	1998			Osman Balci/540-231-4841/balci@vt.edu
Balci	Osman		Verification, Validation, and Testing	In The Handbook of Simulation, J. Banks, Editor, Chapter 10	John Wiley & Sons, New York, NY				335-393	1998			Osman Balci/540-231-4841/balci@vt.edu
Balci	Osman	William F. Ormsby	Well-Defined Intended Uses: An Explicit Requirement for Accreditation of Modeling and Simulation Applications	Proceedings of the 2000 Winter Simulation Conference (Orlando, FL, Dec. 10-13, 2000)	IEEE, Piscataway, NJ				849-854	2000			Osman Balci/540-231-4841/balci@vt.edu
Banks	J.	D. M. Gerstein, and S. P. Searles	Verification and Validation of Large Scale Simulation Models		Proceedings of the 1990 UKSC Conference on Computer Simulation, pp. 1-6					1990	Validation, Verification		From Old DMSO VV&A Bibliography: Valuable Construct
Barber	T.J.		Role of Code Validation and Certification in the Design Environment	AIAA Journal			24	11	1185-1210	1997		Abstract: The question frequently asked after a computational fluid dynamics (CFD) solution has been obtained, How do I know my answer is correct? is considered. Most engineering organizations using CFD codes in support of their design processes attempt to assess this issue and to reduce the risks incurred by evaluating the usability of the results. Whereas there are several forms of risk, the primary issues focused on in this work are accuracy and reduced variability (robustness). The role of benchmark or validation studies in establishing a code's accuracy is examined. Examples are presented illustrating the difficulty in relying on benchmark studies to validate a code for design usage. Ways of reducing code usage variability are also suggested, including performing numerical experiments and design calibrations.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov

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Barber	T.J.		The Role of Code Validation and Certification in the Design Environment	: AIAA Paper No. 96-2033			AIAA 98-2637		9	1998		Abstract: This paper considers the question frequently asked after a CFD solution has been obtained, i.e. "how do I know my answer is correct?" Most engineering organizations using CFD codes in support of their design processes attempt to assess this issue and reduce the risks incurred by evaluating the usability of the results: While there are several forms of risk, the primary issues focused on in this paper are accuracy and reduced variability (robustness). The role of benchmark or validation studies in establishing a code's accuracy is examined. Examples are presented illustrating the difficulty in relying on benchmark studies to validate a code for design usage. Ways of reducing code usage variability are also suggested, including performing numerical experiments and design calibrations.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Barlow	J.		A Role Model for Quality Management in Finite Element Analysis		NATO Advisory Group for Aerospace Research and Development (AGARD) Report No. 772 Analytical Qualification of Aircraft Structure. NTIS, paper #1					1990			From Old DMSO VV&A Bibliography: DoD/Navy is trying to do with M&S in the limited aerostructure domain. 6.1 on pp. 1-6 valuable
Barnes	CDR Steven "Boots"	Sharon R. Nichols, Michael L. Metz, MAJ Joe Mansir	The Joint Warfare System (Jwars) Assessment Process	Proceedings of the 2001 International Test and Evaluation Association (ITEA) ITEA Modeling and Simulation Conference, December 3-6, 2001	International Test and Evaluation Association					37226	verification, validation, accreditation, JWARS	This paper describes that assessment process that includes developmental test and evaluation (DT&E); verification and validation (V&V); Beta testing; and a planned operational test and evaluation (OT&E).	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Barney	P.	C. Ferregut, L. Perez, N. Hunter, and T. Paez	Statistical Validation of System Models	Proceedings of the 30th Annual Hawaii International Conference on System Sciences (Maui, Hawaii 1997)						1997	Validation, Statistical		
Barruncho	Luis M. F.	and J. P. Sucena Paiva	Formal V&V in advanced Energy Management Systems		6th Mediterranean Electrotechnical Conference Proceedings, pp. 1125-1132					Jun-05	Validation, Verification		From Old DMSO VV&A Bibliography: Useful references
Bartholomew	P.		The Role of Structural Analysis in Airworthiness Certification		NATO Advisory Group for Aerospace Research and Development (AGARD) Report No. 772 Analytical Qualification of Aircraft Structure. NTIS, paper #10					1990			From Old DMSO VV&A Bibliography: Great Parallel Paradigm
Barton	J. M.	J. M. Summa	CFD verification and validation in commercial design and analysis	AIAA Paper 98-2640 (AIAA Accession number 32826)	AIAA, Fluid Dynamics Conference, 29th, Albuquerque, NM					June 15-18, 1998	verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Benek	John A.	Kraft, Edward M.; Lauer, Rodney F.	Validation Issues for Engine • Airframe Integration	AIAA Journal			AIAA-96-2164		12	1996		Abstract: The engine-airframe integration methodology is reviewed and some process deficiencies are identified. The use of computational fluid dynamics as an alternative simulation source is discussed. An approach toward combining computations with the existing integration methodology is suggested. Validation issues associated with the computational procedures are examined. Computational fluid dynamics as a source of test facility corrections is found to be well developed, but validation efforts remain ad hoc. The use of computational fluid dynamics to evaluate inlet drag increments and to generate high-resolution total pressure maps is discussed. Related validation issues include the simulation of unsteady flow with steady-state approximations.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov

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Bernard	Prosper M.	and Michel Plaisent	Validation Process in Simulation		Proceedings of the Society for Computer Science (SCS) Multiconference on Simulation in Business and Management, pp. 84-88					1990			From Old DMSO VV&A Bibliography:
Bezier	B.			Software Testing Techniques	Van Nostrand Reinhold					1990		Considered the text in the area	Stevenson/864-656-5880/steve@cs.clemson.edu
Bittanti	Sergio			Software Reliability Modeling and Identification	Springer Verlag					1988		Reliablity language w.r.t. programs	Stevenson/864-656-5880/steve@cs.clemson.edu
Blechinger	Pamela I.		Verification, validation, and accreditation (VV&A) of distributed interactive simulations (DIS)	AIAA Paper 96-3338 (AIAA Accession number 31849); Collection of Technical Papers (A96-31842 08-01)	AIAA Test and Evaluation International Aerospace Forum, 2nd, London, United Kingdom					June 25-27, 1996	Verification, validation, and accreditation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Boeck	Helmuth	Vaughn Standley, Reinhard Viertl	An Investigation of Fidelity Metrics by the Validation of a Safeguards Monitoring System Simulation	Proceedings of the 2000 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Orgranization					36770	validation	This paper discusses the design and validation of a distributed safeguards monitoring system (SMS) simulation is conducted as a means of investigating fidelity metrics. Fitness defines the validity of the simulation	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Boehm	Barry W.		Industrial Software Metrics Top 10 List	IEEE Software	IEEE					1987		Oft quoted article about what's wrong in practice	Stevenson/864-656-5880/steve@cs.clemson.edu
Boehm	Barry W.	Tom DeMarco	Software Risk Management	IEEE Software	IEEE					Jun-05		Entry into risk literature	Stevenson/864-656-5880/steve@cs.clemson.edu
Boehm	Barry W.			Software Engineering Economics	Prentice-Hall					1981		Seminal text	Stevenson/864-656-5880/steve@cs.clemson.edu
Bolignano	D.		Towards the Formal Verification of Electronic Commerce protocols	Proceedings of 10th IEEE Computer Security Foundations Workshop (CSFW)	IEEE Computer Society Press					1997			
Boswell	Robin		Knowledge Refinement using V&V tools	http://www.scms.rgu.ac.uk/research/kbs/krustworks/kruvv2001/; accessed 7 Apr 02						2001	V&V tools	Describes a proposed research project about using V&V tools for knowledge refinement.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Bouajjani	A.	J. C. Fernandez and N. Halbwachs	On the Verification of Safety Properties		Tech. Report, SPECTRE L12, IMAG, Grenoble					1990	Verification		From Old DMSO VV&A Bibliography:
Bowen	J.P.	Hinchey, M. G.	10 Commandments of Formal Methods	Computer			515		171-176	1998			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Bowen	J.P.	Hinchey, M. G.	Applications of Formal Methods		Prentice-Hall		133		179-188	1999			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Bowen	Thomas	Gary Wigle and Jay Tsai		Specifications of Software Quality Attributes	Rome Air Development Center					1985		The original scoring of software text	Stevenson/864-656-5880/steve@cs.clemson.edu
Brackin	Stephen H.	and Ian Sutherland	Fromal Verification of Mathematical Software. Volume 2.		Odyssey Research Associates, Inc. Report RADC-TR-90-53-VOL-2 (AD-A223 633)					1990			From Old DMSO VV&A Bibliography: Computer arithmetic can cause problems
Brade	Dirk		Enhancing Modeling And Simulation Accreditation By Structuring Verification And Validation Results	Proceedings of the 2000 Winter Simulation Conference	Society for Computer Simulation International					36861	verification, validation	This paper introduces a refined V&V process, identifying the major influence factors on applicable V&V and a conceptual approach for subphase-wise organization of V&V activities.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Brade	Dirk	Andreas Köster	Risk-based Validation & Verification Levels Definition	Proceedings of the 2001 European Simulation Interoperability Workshop	Simulation Interoperability Standards Orgranization					37043	verification, validation	Following the CLIMB example V&V levels or credibility levels are defined that are related to the criticality of the user's simulation based decision.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com

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Brade	Dirk	Richard Maguire and Heinz-Bernd Lotz	Arguments-based Credibility Levels	Proceedings of the 2002 European Simulation Interoperability Workshop	Simulation Interoperability Standards Organziation					June 24-26, 2002	Verification, Validation, Levels, Credibility, Model Decomposition, Claims-Arguments-Evidence Concept	Continuing the credibility indicators approach we presented during the Euro-SIW 2001, we decomposed the claim of validity and correctness of an M&S in numerous sub-claims. For each sub-claim, we identified commonly used arguments for its validity or correctness and assigned them to the credibility categories or levels. Additionally, we have defined minimum requirements for the probative force of evidence for each credibility level.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Bradley	B. W.	D. C. Muscietta, M. A. Vincent, J. G. Thomas, and P. H. Beavers	Phase II Accreditation Efforts for the AMSAA Low Energy Laser Weapon Simulation (LELAWS)		Army Materiel Systems Analysis Activity (AMSAA) Briefing, LELAWS 1992					Jun-05	Accreditaiton, Verification, Validation		From Old DMSO VV&A Bibliography: AMSAA Accreditation efforts for LELAW Simulation
Bradley	James H.		Limits of Simulation: Estimation and Detection		Proceedings of the 1991 Summer Computer Simulation Conference in Baltimore, MD, pp. 9-14					1991			From Old DMSO VV&A Bibliography: Discusses techniques to determine a simulation limits
Bradley	R.G.		CFD Validation Philosophy		North Atlantic Treaty Organization				77-100	1996		Abstract: Computational Fluid Dynamics (CFD) is becoming an increasingly powerful tool in design and analysis of fluid dynamic and aerospace systems. Application of CFD to practical design problems requires a high level of confidence, which in turn requires focused experimentation to verify the accuracy of CFD codes. The need for CFD validation is presented from the viewpoint of the user, and a general philosophy for validation of CFD codes is introduced, highlighting the requirements for disciplined experimentation and careful evaluation of the bounds of error in CFD solutions.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Brand	John	Steven Kovel and Hal Harrelson	Building Confidence in Battlefield Analysis Models		Army Research Laboratory (ARL-MR-326) -- distribution restricted to DoD and DoD contractors only					35370	modeling, VV&A, validation, verification, confidence, accreditation	Discusses three aspects of building confidence for battlefield analysis models: Amry guidance and its programmatic implications; a philosophical approach to building confidence with simulations composed of more than one simulation or submodel; and the confidence gained in two battlefield analysis models dealing with sensors and communications.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu; keywords & description from document abstract.
Brooks	Frederick P.			The Mythical Man Month: Essays on Software Engineering.	Addison-Wesley					1995		What can I say? this is the seminal software engineering text from the master	Stevenson/864-656-5880/steve@cs.clemson.edu
Brown	James L.	Dinesh K. Prabhu, Michael J. Wright, Joseph G. Marvin, and Ethiraj Venkatapathy	X-33 aerothermal design environment predictions - verification and validation	AIAA Paper 2000-2686 (AIAA Accession number 33735)	AIAA Thermophysics Conference, 34th, Denver, CO					June 19-22, 2000	verification, validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Brykczynski	Bill R.	Reginald N. Meeson and Christine Youngblut	A Strategic Defense Initiative Organization Software Testing Initiative		Institute for Defense Analyses Report IDA/HQ-90-036099 (AD-A239 262)					1990			From Old DMSO VV&A Bibliography:
Brykczynski	Bill R.	Christine Youngblut and Reginald N. Meeson	An Examination of Selected COmmercial Software Testing Tools		Institute for Defense Analyses Report IDA/HQ-91-39501 (AD-A243 089)					1991			From Old DMSO VV&A Bibliography: Oriented to analysis of Ada code
Burg	C.	C. Burg, K. Sreenivas, D. Hyams and B. Mitchell	Unstructured Nonlinear Free Surface Flow Solutions: Validation and Verification	AIAA Paper 2002-2977	32nd AIAA Fluid Dynamics Conference and Exhibit						verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Byrne	John	Murray Gibb, Jerry Golub, and Tina Schechter	Validation Plan for a Space-Based Radar Simulation		Proceedings of the 1990 Summer Computer Simulation Conference in Calgary, Canada, pp. 737-742					1990	Validation, Verification		From Old DMSO VV&A Bibliography: Focus on Management Aspects of Validation - Very General
Callahan	John R.			Verification and Validation in a Rapid Development Process	Government Printing Office					1995		Case study. Problems with tools that generate code	Stevenson/864-656-5880/steve@cs.clemson.edu

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Canova	Bradford S.	Peter H. Christensen, Michael D. Lee, Bruce R. Tripp, Michael H. Pack, David L. Pack	Simulation To Support Operational Testing: A Practical Application	Proceedings of the 1999 Winter Simulation Conference	Society for Computer Simulation International					36495	verification, validation, Predator SRAW	This paper describes a combined effort between the Marine Corps Systems Command (MARCORSYSCOM), the Marine Corps Operational Test and Evaluation Activity (MCOTEA) and the MITRE Corporation to exploit M&S to support Operational Test (OT) of the Predator Short Range Assault Weapon (SRAW).	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Carnap	Rudolf		Testing and Meaning	Philosophy of Science						1936-1937		This is the foundation of logical involvement in science. Foundations for any tool development	Stevenson/864-656-5880/steve@cs.clemson.edu
Carr, III	John T.	Osman Balci	Verification and Validation of Object-Oriented Artifacts Throughout the Simulation Model Development Life Cycle	Proceedings of the 2000 Winter Simulation Conference (Orlando, FL, Dec. 10-13, 2000)	IEEE, Piscataway, NJ				866-871	Jun-05			Osman Balci/540-231-4841/balci@vt.edu
Caughlin	Don		Verification, Validation, and Accreditation (VV&A) of Models and Simulations through Reduced Order Metamodels	Proceedings	1995 Winter Simulation Conference				612-620	1997		Abstract: This paper provides a new approach to support Verification, Validation, and Accreditation (VV&A) of models and simulations. The need for efficient and objective methods to verify, validate and accredit models and simulations is greater than ever. More and more decisions are based on computer generated data that are derived from models and simulations. The strength of these decisions is a direct function of the validity of this data. Based on the system identification of reduced order models, this new approach approximates a complex high-dimensional model or simulation by a relatively simple mathematical model valid over a specified domain and range of interest. Verification or validation is then accomplished by the straightforward comparison of the reduced order model structure and coefficients with the baseline data or system. Well-developed identification methods and a structured procedure make this process more efficient and objective than existing methods.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Caughlin	Don		An Integrated Approach To Verification, Validation, And Accredition Of Models And Simulations	Proceedings of the 2000 Winter Simulation Conference	Society for Computer Simulation International					36861	verification, validation, accreditation	This paper presents an integrated approach to VV&A from a system perspective and identifies the relationships between the M&S resources in an integrated V&V program.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Chew	Jennifer	Cindy Sullivan	TECOM M&S VV&A Methodology – A Cookbook Approach	Proceedings of the 1999 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Orgranization					36220	verification, validaiton	This paper discusses why the U.S. Army Test and Evaluation Command (TECOM) developed a Verification, Validation and Accreditation (VV&A) methodology, summarizes the contents of the methodology, and shares some of the lessons learned.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Chew	Jennifer	Cindy Sullivan	Verification & Validation: International Credibility Levels for T&E	Proceedings of the 2001 International Test and Evaluation Association (ITEA) ITEA Modeling and Simulation Conference, December 3-6, 2001	International Test and Evaluation Association					Dec-01	verification, validation	The V&V working group is responsible for preparing an ITOP consisting of procedures and guidance documentation on the optimum use of V&V and on how to transfer information from the V&V process to other nations. The purpose of the V&V ITOP is to provide standard guidance for the V&V of models and simulations that are associated with test and evaluation and to increase the credibility of those models and simulations.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Chew	Jennifer	Cindy Sullivan	Verification, Validation, And Accreditation In The Life Cycle Of Models And Simulations	Proceedings of the 2000 Winter Simulation Conference	Society for Computer Simulation International					Dec-00	verification, validation, accreditation	This paper discusses the activities and tasks during the early stages of model development and addresses each of the VV&A efforts separately, along with its associated activities. It outlines the specific VV&A activities and products that are appropriate to each phase of model development.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Chiles	J.P.	Delfiner, P	Geostatistics: Modeling Spatial Uncertainty		Wiley		4	2	27-38	Jun-05			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov

Lead Author Last Name	Lead Author First Name & MI	Other Authors	Item Title	Journal/Book Title	Publisher	ISBN/ISSN	Chapter or Volume	Edition/Issue (volume may be in column to left)	Pages	Publication Date	Keywords	Annotation (2-3 sentences about item significance)	Item submitted by (name/phone/email)
Christensen	Peter H.	Bradford S. Canova, Michael D. Lee, Bruce R. Tripp, Michael H. Pack, David L. Pack	Simulation To Support Operational Testing: A Practical Application	Proceedings of the 1999 Winter Simulation Conference	Society for Computer Simulation International					Dec-99	verification, validation, Predator SRAW	This paper describes a combined effort between the Marine Corps Systems Command (MARCORSYSCOM), the Marine Corps Operational Test and Evaluation Activity (MCOTEA) and the MITRE Corporation to exploit M&S to support Operational Test (OT) of the Predator Short Range Assault Weapon (SRAW).	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Clarke	E. M.	D. E. Long and K. L. McMillan	A Language for Compositional Specification and Verification of Finite State Hardware Controllers		Proc. IEEE, Vol. 79, pp. 1283-1292					1991	Verification		From Old DMSO VV&A Bibliography:
Coleman	H. W.	Stern, F.	Uncertainties and CFD Code Validation	Journal of Fluids Engineering			119		795-803	Jun-05	uncertainty, validation		Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Coleman	H.W.	Stern, F.	Uncertainties and CFD Code Validation	Journal of Fluids Engineering			AIAA-96-2051		24	1996		Abstract: A new approach to computational fluid dynamics code validation is developed that gives proper consideration to experimental and simulation uncertainties. The comparison error is defined as the difference between the data and simulation values and represents the combination of all errors. The validation uncertainty is defined as the combination of the uncertainties in the experimental data and the portion of the uncertainties in the CFD prediction that can be estimated. This validation uncertainty sets the level at which validation can be achieved. The criterion for validation is that the magnitude of the comparison error must be less than the validation uncertainty. If validation is not accomplished, the magnitude and sign of the comparison error can be used to improve the mathematical modeling. Consideration is given to validation procedures for a single code, multiple codes and/or models, and predictions of trends. Example results of verification/validation are presented for a single computational fluid dynamics code and for a comparison of multiple turbulence mo	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Coleman	Hugh W.	W. Glenn Steele, Jr.		Experimentation and Uncertainty Analysis for Engineers	John Wiley & Sons, New York, NY	0-471-12146-0				1999	error, uncertainty, validation	Has excellent treatment of error & uncertainty as they impact simulation validity; reviews standards for describing error & uncertainty	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Collofello	James S.		Introduction to Software Verification and Validation		Cernegie Mellon University Software Engineering Institute	SEI Curriculum Module SEI-CM-13-1.1			25	32478	Verification, Validation, Software	SEI Curriculum Module on software verification and validation	Dave Hall; 760-446-4624;daveh@survice.com
Como	F.	A. Manzone, A. Pincetti, M. Sonza Reorda, and G. Squillero	Automatic Test Bench Generation for Validation of RT-level Descriptions: an Industrial Experience	DATE2000: Design, Automation and Test in Europe, Paris (F), available at http://www.cad.polito.it/FullDB/exact/date2000a.html (accessed September 2002)	CAD Group Publications				pp. 385-389	March 2000	Approximate Methods, Design Validation, Evolutionary Algorithms, Genetic Algorithms, RT-Level, Simulation-Based Approaches, VHDL	In current microprocessors and systems, an increasingly high silicon portion is derived through automatic synthesis, with designers working exclusively at the RT-level, and design productivity is greatly enhanced. However, in the new design flow, validation still remains a challenge: while new technologies based on formal verification are only marginally accepted, standard techniques based on simulation are beginning to fall behind the increased circuit complexity. This paper proposes a new approach to simulation-based validation, in which a Genetic Algorithm helps the designer in generating useful input sequences to be included in the test bench. The technique has been applied to an industrial circuit, showing that the quality of the validation process is increased.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Conwell	Candace L.	Rosemary Enright, Marcia A. Stutzman	Capability Maturity Models Support of Modeling and Simulation Verification, Validation, and Accreditation	Proceedings of the 2000 Winter Simulation Conference	J. A. Joines, R. R. Barton, K. Kang, and P. A. Fishwick, eds.				819-828	December 10-13, 2000	Capability Maturity Model, Modeling, Simulation, Verification, Validation, Accreditation	This paper discusses how the use of these the SW-CMM and SA-CMM can improve DoD's ability to develop M&S with the customer's need for VV&A in mind.	Marcia Stutzman / (301) 317-9698 / mstutzman@logicon.com

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Conwell	Candace L.	Rosemary Enright, Marcia A. Stutzman	CAPABILITY MATURITY MODELS SUPPORT OF MODELING AND SIMULATION VERIFICATION, VALIDATION, AND ACCREDITATION	Proceedings of the 2000 Winter Simulation Conference	J. A. Joines, R. R. Barton, K. Kang, and P. A. Fishwick, eds.				819-828	December 10-13, 2000	Capability Maturity Model, Modeling, Simulation, Verification, Validation, Accreditation	This paper discusses how the use of these the SW-CMM and SA-CMM can improve DoD's ability to develop M&S with the customer's need for VV&A in mind.	Marcia Stutzman / (301) 317-9698 / mstutzman@logicon.com
Conwell	Candace L.		Enforcing VV&A	Simulation Technology Magazine				Volume 2 Issue 3d		Thursday, March 22, 2000	Verification, Validation	This paper addresses the problems with consistent enforcement of verification and validation management policies.	Marcia Stutzman / (301) 317-9698 / mstutzman@logicon.com
Conwell	Candace L.		Enforcing VV&A	Simulation Technology Magazine				Volume 2 Issue 3d		Thursday, March 22, 2000	Verification, Validation	This paper addresses the problems with consistent enforcement of verification and validation management policies.	Betsy DeLong / (301) 744-4457 / delongbb@ih.navy.mil
Conwell	Candace L.		How Much Does it Cost to V&V?	Simulation Technology Magazine				Volume 2 Issue 4		Thursday, July 20, 2000	Verification, Validation	This paper discusses the difficulties in determining the costs associated with verification and validation.	Marcia Stutzman / (301) 317-9698 / mstutzman@logicon.com
Conwell	Candace L.		How Much Does it Cost to V&V?	Simulation Technology Magazine				Volume 2 Issue 4		Thursday, July 20, 2000	Verification, Validation	This paper discusses the difficulties in determining the costs associated with verification and validation.	Betsy DeLong / (301) 744-4457 / delongbb@ih.navy.mil
Conwell	Candace L.		VV&A	Simulation Technology Magazine	Simulation Interoperability Standards Orgranization						verification, validation, accreditation	The article discusses the meaning of VV&A.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Conwell	Candace L.		VVA - Requirements and Acceptability Criteria	Simulation Technology Magazine	Simulation Interoperability Standards Orgranization			Vol. 4 Issue 3		36968	verification, validation, accreditation, requirements, acceptability criteria	The article discusses M&S requirements and their relationship to acceptability criteria	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Conwell	Candace L.		What is VV&A anyway?	Simulation Technology Magazine	Simulation Interoperability Standards Orgranization						verification, validation, accreditation	The article discusses the need to do VV&A.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Cooper	Captain Lawrence A. (USAF)		Verification and Validation of the Comprehensive Operational Support Model for Space (Thesis)		Air Force Institute of Technology (DTIC) AD - A243 653					13-Jun-05	Verification, Validation		From Old DMSO VV&A Bibliography: Master's Thesis. See pp 10-12
Cornford	Steven, L.	Feather, M.S.; Hicks, K.A.	DDP - a tool for life-cycle risk management	Proceedings of the 2001 IEEE Aerospace Conference	IEEE		Volume 1		441-451	36951	Risk Management, Risk Assessment, Risk Reduction, Quantitative Reasoning	Describes a process and tool that allows users to assess and manage risk. Helps users combine their knowledge so as to determine the cost-effective selection from among a wide range of risk reduction activities (including preventative measures, process co	Martin.S.Feather@Jpl.Nasa.Gov
Cosner	Raymond R.		CFD Validation Requirements for Technology Transition	AIAA Paper No. 95•2227			36	5	676-686	1998		Abstract: Computational Fluid Dynamics technology, as a basis for design decisions, is rapidly gaining acceptance in the aerospace industry. The pace of acceptance is set by the advancing confidence of design team leaders that reliance on CFD can improve the quality of their end product, and reduce the schedule, costs and risks in developing that product. Each of these factors - quality, schedule, cost, and risk - must be suitably demonstrated prior to a prudent decision to increase reliance on CFD predictions. A key element in this continuing process of technology transition is to demonstrate improvements through a systematic validation. New standards for performance of competitive aircraft designs are leading in the requirements for CFD analysis, and in the process for validation.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov

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Cosner	Raymond R.		Experimental Data Needs for Risk Management in CFD Applications	AIAA Paper No. 98•2781			AIAA Paper No. 96-4597			1996		Abstract: The engineering process of CFD applications is advancing at a tremendous pace today. CFD analysis is becoming a trusted tool for engineering design. This acceptance is based on the ability of CFD analysis to produce quantitatively useful data, at consistently high levels of accuracy and process performance. The need for experimental validation data has never been higher. The requirements for focused goals and high accuracy in these experimental data also have never been higher. Almost no experimental data can be found today which meet these demanding requirements.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Cosner	Raymond R.		The Role of Validation in the CFD Process at McDonnell Douglas/St. Louis	AIAA Journal			SAND99-1256			1999		Abstract: Validation is perhaps the major element in transitioning Computational Fluid Dynamics technology from the research and development environment to the air vehicle design environment. Both parties in the process of technology transition must examine carefully the results of validation solutions compared with experimental data. The benefits of validation include risk mitigation, establishment of optimal design processes, and maintaining a sharp focus in research activities.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Coudert	O.	J. C. Madre and C. Berthet	Verifying Temporal Properties of Sequential Machines without Building their State Diagrams		Workshop on Computer-Aided Verification					1990	Verification		From Old DMSO VV&A Bibliography:
Crosby	P.			Quality is Free	McGraw Hill					1979		The origin of extreme programming	Stevenson/864-656-5880/steve@cs.clemson.edu
Croyder	LCDR Harry M.	CMDR William P. Ervin, Dr. David S. Mazel	SPY-1D(V) Models and Simulations Support Operational Testing in a Remote New Jersey Cornfield	Program Manager	Defense Systems Management College			Vol. XXVI, No. 5 DSMC 140	132	Sep-Oct 97	operational testing, modeling and simulation, verification, validation, accreditation	Accredited models and simulations made land-based testing of the SPY-1 radar family more credible than ever before.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Cynamon	Louisa	and William F. Lawton	Subsystem Testing for HIL Integration		Proceedings of the 1991 Summer Computer Simulation Conference in Baltimore, MD, pp. 819-829					1991			From Old DMSO VV&A Bibliography:
Dahl	O.		Verifiable Programming		Prentice-Hall, Englewood Cliffs, New Jersey					1992			From Old DMSO VV&A Bibliography:
Dash	S. M.		Observations on CFD and Turbulence Model Validation/Calibration for the Simulation of High-Speed Propulsive Flowfields		Science Applications International Corp. for the Computational Fluid Dynamics Code Validation/Calibration JANNAF Airbreathing Propulsion Subcommittee Workshop - High-Speed Inlet Forebody Interactions (The Johns Hopkins University) NTIS, pp. 3-29					1991	Validation		From Old DMSO VV&A Bibliography: Useful paper with four levels of validation (pp. 3ff)
Davis	D. O.	J. C. Dudek and J. W. Slater	Validation and verification of the wind code for supersonic diffuser flow	AIAA Paper 2001-0224 (AIAA Accession number 16138)	AIAA, Aerospace Sciences Meeting and Exhibit, 39th, Reno, NV, Jan. 8-11, 2001					Jan. 8-11, 2001	verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Davis	Paul K.	James H. Begelow	Experiments in Multiresolution Modeling (MRM)	Experiments in Multiresolution Modeling (MRM)	The RAND Corporation, Report MR-1004-DARPA	0-8330-2653-4				1998	credibility, validity, multiresolution	This report addresses issues related to multiresolution modeling, and implications for analytic validity.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Davis	Paul K.		Generalizing Concepts and Methods of Verification, Validation, and Accreditation (VV&A) For Military Simulations		RAND, Report R-4249-ACQ					1992	Verification, Validation, Accreditation		From Old DMSO VV&A Bibliography: Some useful VV&A constructs

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Davis	Paul, K.		Aggregation, Disaggregation, and the 3:1 Rule in Ground Combat		MR-638-AF/A/OSD, RAND					1995			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Davis	Paul K.	and Reiner Huber	Variable-Resolution Modeling: Motivations, Issues, and Principles		RAND, N-3400-DARPA					1992			From Old DMSO VV&A Bibliography:
Dean	Frank F.	Barrett, William H.	Transitioning from Test•based to Science•based Certification for Hostile Stockpile•to•Target Sequence Environments		Sandia National Laboratories		AIAA 98-2715		6	1998		Abstract: This system verification process for hostile stockpile-to-target sequence (STS) environments is being applied as part of the system verification of a non-nuclear replacement component for a nuclear weapon currently in the active stockpile. Variations of this process have been used successfully in past nuclear weapon development programs. This process effectively integrates computational modeling and physical testing. Although this discussion concentrates on hostile and fratricide STS environments, the process is adaptable to system verification for normal and abnormal STS environments. This process is being continually modified to include advances in computer technology and computational modeling.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
DeLong	Betsy L.	Melissa O. Miller, Pamela L. Mayne, Marcia A. Stutzman	Verification and Validation: Ensuring Data Credibility	Proceedings of the 2001 European Simulation Interoperability Workshop	Simulation Interoperability Standards Organization					June 25- 27, 2001	Accreditation, data, distributed simulation, federation, verification, validation	This paper looks at the problem of data V&V and provides recommended procedures to incorporate it into the M&S life-cycle process.	Betsy DeLong / (301) 744-4457 / delongbb@ih.navy.mil
Desel	Joerg		Model Validation -- A Theoretical Issue?	Application and Theory of Petri Nets 2002 (eds. J. Esparza and C. Lakos); Vol. 2360 in Lecture Notes in Computer Science	Springer-Verlag (Berlin Heidelberg New York)				23-43	2000			Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Desel	Joerg		Validation of Process Models by Construction of Process Nets	Business Process Management (editors: W. van der Aalst, J. Desel, and A. Oberweis); Vol. 1806 in Lecture Notes in Computer Science	Springer-Verlag (Berlin Heidelberg New York)				110-128	2000			Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Desel	Joerg		Validation of System Models Using Partially Ordered Runs	Modeling and Simulation: A Tool for the Next Millennium, Proceedings of the 13th European Simulation Multiconfference ESM '99, Warschau, June 1999 (ed. H. Szczerbicka)	Society for Computer Simulaiton				295-302	1999			Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Desel	Jörg		TEACHING SYSTEM MODELING, SIMULATION AND VALIDATION	Proceedings of the 2000 Winter Simulation Conference, J. A. Joines, R. R. Barton, K. Kang, and P. A. Fishwick, eds.; http://www.informs-cs.org/wsc00papers/230.PDF (accessed August 2002)	Society for Computer Simulation (SCS)					2002	teaching, V&V	Simulation is used in the design process of dynamic systems. The results of simulation are employed for validating a model, and they are helpful for the improvement of the design of a system with respect to both, qualitative and quantitative properties. The paper concentrates on these aspects and applications of simulation in education, advocates its presence in student curricula, presents building blocks of education modules for simulation and validation with respect to both content and method, discusses requirements for simulation and validation education, and finally suggests the integration of simulation teachware in virtual classrooms and distance learning environments. of models in detail. Simulation of a system model is an approved method for validation if the simulation results can be compared with the intended behavior of the system	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Deslandres	V.	and H. Pierreval	Expert System Prototype Assisting the Statistical Validation of Simulation Models		Simulation, Vol. 56, No. 2, pp. 79-89					1991			From Old DMSO VV&A Bibliography: Theoretical start, but too far from implementation for our use

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Dick	LCDR James H.	Terri Coutts Morgan	Validation Of The Joint Simulation System: A Collaborative Approach	Proceedings of the 1999 International Test and Evaluation Association Modeling and Simulation Workshop	International Test and Evaluation Association					Dec-99	verification, validation, JSIMS	This paper addresses the collaborative methodologies being employed to complete the validation of JSIMS. It describes the validation paradigm developed and discuss the methods employed to complete the validation of JSIMS for the joint user.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Diener	D.A.	H.R. Hicks and L.L. Long	Comparison Of Models: Ex Post Facto Validation/Acceptance?		Proceedings of the 1992 Winer Simulation Conference					1992			From Old DMSO VV&A Bibliography:
Dillard	Dr. Archie E.	N/A	Validation of Advanced Flight Simulators For Human Factors Operational Evaluation and Training Programs	Validation of Advanced Flight Simulators For Human Factors Operational Evaluation and Training Programs			1		87	12-Sep-02	Flight Simulation, Simulator Approval	Objective metrics to determine operational fidelity as compared to actual aircraft performance and design data.	Dr. A. E. Dillard, 405-954-4562, archie.dillard@faa.gov
DMSO			DoD M&S Verification, Validation, and Accreditation		DoD			Editor: S. Youngblood		23-Jun-05			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
DMSO			VV&A Recommended Practices Guide		http://www.msiac.dmso.mil/vva/					24-Jun-05			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
DMSO.			DoD M&S Verification, Validation, and Accreditation		https://www.dmso.mil/public/transition/vva/					2002			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
DOD			Department of Defense Modeling and Simulation Management	Department of Defense Directive (DODD) 5000.59	Department of Defense				13	20-Jan-98	Modeling and Simulation Management, DOD Directive	The DOD Directive on M&S Management	Dave Hall; 760-446-4624;daveh@survice.com
DOD			Department of Defense Modeling and Simulation Management	Department of Defense Directive (DODD) 5000.59	Department of Defense				13	20-Jan-98	Modeling and Simulation Management, DOD Directive	The DOD Directive on M&S Management	Dave Hall; 760-446-4624;daveh@survice.com
DOD			DOD Dictionary of Military and Associated Terms		Department of Defense	Joint Publication 1-02				37244	Definitions	The official dictionary of the Department of Defense	Dave Hall; 760-446-4624;daveh@survice.com
DOD			DoD FY95 Master Plan for Target Interaction, Lethality and Vulnerability (TILV) Science and Technology (S&T) Programs, Volume I: Classical Ballistic Threats		Department of Defense					Revised 4 May 1995	Vulnerability, Lethality, Science and Technology, M&S Costs, M&S Cost-Benefit	The Master Plan for the TILV community (6.2 S&T programs related to vulnerability and lethality). TILV made estimates of the cost-benefit (Return on Investment) for programs using modeling and simulation.	Dave Hall; 760-446-4624;daveh@survice.com
DOD			DOD Modeling and Simulation (M&S) Verification, Validation and Accreditation	Department of Defense Instruction (DODI) 5000.61	Department of Defense				15	35184	Modeling and Simulation, VV&A	The DOD Instruction on VV&A	Dave Hall; 760-446-4624;daveh@survice.com
DOD			DOD Modeling and Simulation (M&S) Verification, Validation and Accreditation	Department of Defense Instruction (DODI) 5000.61	Department of Defense				15	35184	Modeling and Simulation, VV&A	The DOD Instruction on VV&A	Dave Hall; 760-446-4624;daveh@survice.com
DOE			Strategic Computing & Simulation Validation & Verification Program: Program Plan		Department of Energy, Defense Programs, Stockpile Stewardship Program					Jun-05		Abstract: As a result of the United States' intention to pursue a "zero yield" Comprehensive Test Ban Treaty, the Department of Energy has undertaken the Stockpile Stewardship Program (SSP) to ensure confidence in the safety, performance, and reliability of the US nuclear stockpile. A greater reliance on computational modeling and simulation is called for as a cornerstone of the SSP. Because simulation plays a key role for the SSP, this focused validation and verification (V&V) program is essential. This plan outlines such a program for ensuring that computer code projects apply the appropriate means to achieve high confidence in the use of simulations for stockpile assessment and certification. Specific validation and verification activities are described in detail in the Stockpile Computing and Accelerated Strategic Computing Initiative (ASCI) code project implementation plans.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov

Lead Author Last Name	Lead Author First Name & MI	Other Authors	Item Title	Journal/Book Title	Publisher	ISBN/ISSN	Chapter or Volume	Edition/Issue (volume may be in column to left)	Pages	Publication Date	Keywords	Annotation (2-3 sentences about item significance)	Item submitted by (name/phone/email)
Dorner	Dietrich			The Logic of Failure	Perseus Books	0-201-47948-6			223	1996		This book is about recognizing and avoiding error in complex situations. Complicated situations seem to elicit habits of thought that set failure in motion from the beginning. From that point, the continuing complexity of the task and the growing apprehension of failure encourage methods of decision making that make failure even more likely and then inevitable. This book is about how to learn about these tendencies and then breaking the logic of failure. The author uses experiments with participants in world games to illustrate his points.	Hemsch
Draper	David		Assessment and Propagation of Model Uncertainty	Journal of the Royal Statistical Society B			82	145-162		1995		Abstract: In most examples of inference and prediction, the expression of uncertainty about unknown quantities y on the basis of known quantities x is based on a model M that formalizes assumptions about how x and y are related. M will typically have two parts: structural assumptions S, such as the form of the link function and the choice of error distribution in a generalized linear model, and parameters theta whose meaning is specific to a given choice of S. It is common in statistical theory and practice to acknowledge parametric uncertainty about theta given a particular assumed structure S; it is less common to acknowledge structural uncertainty about S itself. A widely used approach involves enlisting the aid of x to specify a plausible single 'best' choice S* for S, and then proceeding as if S* were known to be correct. In general this approach fails to assess and propagate structural uncertainty fully and may lead to miscalibrated uncertainty assessments about y given x. When miscalibration occurs it will often result in understatement of inferential or predictive u	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Dudek	J. C.	D. O. Davis and J. W. Slater	Validation and verification of the wind code for supersonic diffuser flow	AIAA Paper 2001-0224 (AIAA Accession number 16138)	AIAA, Aerospace Sciences Meeting and Exhibit, 39th, Reno, NV, Jan. 8-11, 2001					Jan. 8-11, 2001	verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Dunlap	Scott	Sarah Aust and CDR Charles Frye	A Web-Enabled Resource Center Provides Structure And Simulation Reusability	Proceedings of the 2002 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Organziation					Mar. 10-15, 2002	Process models, simulation, interoperability, verification, validation, tools	This paper describes an approach for improving decision support capability through discrete event simulation and web-enabled technology. The standard methodology incorporated and lessons learned described in this paper will be beneficial to any organization attempting to build and validate simulation-based decision support capability in today's dynamic environment.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Dykman	Dixon D.	Gerald M. Pearman	Statistical Validation of a Re-Engineered Legacy Simulation	Proceedings of SimTec T 2000, 28 February to 2 March 2000, Sydney, Australia	Simulation Industry Association of Australia Limited A.C.N.					Mar-00	statistical validation	The statistical validation process described in this paper supports validation efforts of re-hosted simulations.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Dziuban	Stephen T.	Thomas F. Curry, Peter L. Knepell, and William J. Riley	The Synergism of Simulation and Experimental Design for Training, Optimization and Validation Purposes		Proceedings of the 1992 Summer Computer Simulation Conference in Reno, Nevada, pp. 1002-1006					Jun-05			From Old DMSO VV&A Bibliography:
Easterbrook	S. M.	J. R. Callahan	Formal Methods for Verification and Validation of Partial Specifications: A Case Study	Journal of Systems and Software			40	3		20-Jun-05			
Easterbrook	Steven	John Callahan and Virginie Wiels	V&V through Inconsistency Tracking and Analysis	http://www.cs.toronto.edu/~sme/papers/1998/NASA-IVV-98-002.pdf; accessed 7 April 2002 --							V&V, inconsistency tracing	The research described in this paper was carried out by West Virginia University under NASA cooperative agreement #NCC 2-979 and Grant #NAG 2-1134. A research agenda for a study into the use of inconsistency analysis as a tool for software V&V, and in particular, the use of category theory as a basis for modeling consistency relationships between the various artifacts of software development, including specifications, design, test cases, etc.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu

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Easterling	Robert G.		Measuring the Predictive Capability of Computational Models: Principles and Methods, Issues and Illustrations		Sandia National Laboratories Report SAND2001-0243					36923	validation, uncertainty, measurements	Addresses limits on capability to quantify simulation accuracy and fidelity for detailed models of physical processes.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Ellis	Dr. Sharon T.	Tichenor, Myron H.; Krenz, Timothy G.	Documentation Assessment Report		ENTEK				43	34304	Documentation Assessment; Documentation Requirements; ESAMS; ALARM; RADGUNS	The report describes format and content standards for model documentation, and provides specific recommendations for upgrading existing documentation for three aircraft survivability models to meet those standards. The specific models are the Enhanced Su	E. Ketcham/760-939-4251/ketchamej@navair.navy.mil
Ellis	Dr. Sharon T.	Krenz, Timothy G.	Software Verification Requirements Study		JTCG/AS				26	Jun-92	SMART Project; Verification Requirements; ESAMS; ALARM; RADGUNS	The report reviews and summarizes MIL-STD, DoD-STD and service-specific guidelins for software verification and analyzes them for application to mature M&S. The report concludes with recommendations as to a minimum set of documentation required to suppor	E. Ketcham/760-939-4251/ketchamej@navair.navy.mil
Ellis	Sharon	John Hancock	Pilot Verification Study Report		Joint Technical Coordinating Group on Aircraft Survivability (JTCG/AS)	ENTEK/ABQ-94-0106-TR			35	34381	Verification, pilot study, documentation assessment	ENTEK, Inc. conducted a pilot study for the SMART program by verifying parts of three M&S to demonstrate the benefits and costs of conducting verification by functional element, rather than by inherent code structure.	Dave Hall; 760-446-4624;daveh@survice.com
Ellis	Sharon	John Hancock	Pilot Verification Study Report		Joint Technical Coordinating Group on Aircraft Survivability (JTCG/AS)	ENTEK/ABQ-94-0106-TR			35	34381	Verification, pilot study, documentation assessment	ENTEK, Inc. conducted a pilot study for the SMART program by verifying parts of three M&S to demonstrate the benefits and costs of conducting verification by functional element, rather than by inherent code structure.	Dave Hall; 760-446-4624;daveh@survice.com
Ervin	CMDR William P.	LCDR Harry M. Croyder, Dr. David S. Mazel	SPY-1D(V) Models and Simulations Support Operational Testing in a Remote New Jersey Cornfield	Program Manager	Defense Systems Management College			Vol. XXVI, No. 5 DSMC 140	132	Sep-Oct 97	operational testing, modeling and simulation, verification, validation, accreditation	Accredited models and simulations made land-based testing of the SPY-1 radar family more credible than ever before.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Eshow	Michelle M.	Ing. Diego Orlandi, Dott. Giovanni Bonaita, and Maj. Sergio Barbieri	Results of an A109 Simulation Validation and Handling Qualities Study		Vertica - Vol. 14, No.2, pp. 217-235					1990	Validation		From Old DMSO VV&A Bibliography:
Feather	Martin, S	Smith, B	Automatic Generation of Test Oracles - From Pilot Studies to Application	Journal of Automated Software Engineering	Kluwer		Volume 8	Number 1	31-61	Jan-01	Testing, Test Oracles, Verification, Validation, Planning, Autonomous Systems, DS1	Application area is testing of an AI planning system that forms a key component of an autonomous spacecraft. Describes a progression from pilot studies to develpoment and use of automation for domain-specific verification and validation.	Martin.S.Feather@Jpl.Nasa.Gov
Feather	Martin, S	Menzies, T.	Converging on the Optimal Attainment of Requirements	Proceedings of the IEEE Joint International Conference on Requirements Engineering, Essen, Germany	IEEE				263-270	1-Sep-02	Optimization, Risk, Requirements, Cost-Benefit Analysis	Reducing risk (e.g., through application of V&V) leads to better attainment of requirements, but at a greater cost. Shown here is the use of optimization techniques to locate optimal cost-benefit points, and identify the most critical decisions therein.	Martin.S.Feather@Jpl.Nasa.Gov
Feather	Martin, S	Sigal, B.; Cornford, S.L.; Hutchinson, P.	Incorporating Cost-Benefit Analyses into Software Assurance Planning	Proceedings of the IEEE/NASA 26th Software Engineering Workshop, Greenbelt, MD	IEEE				62-68	37196	Software Assurance, Cost-Benefit Analysis, Risk Management	The objective is to use cost-benefit analyses to identify, for a given project, optimal sets of software assurance activities. Achhieved by incorporating cost-benefit calculations into a risk management framework.	Martin.S.Feather@Jpl.Nasa.Gov
Feather	Martin, S		Model-checking for validation of a fault-protection system	Proceedings of the 6th IEEE International Symposium on High Assurance Systems Engineering, Boca Raton, FL	IEEE				32-41	37196	Model Checking, Formal Methods, Verification, Validation, Fault Protection, State Machines	Shows the use of model checking to validate key requirements of a critical system, that of fault protection for a spacecraft.	Martin.S.Feather@Jpl.Nasa.Gov
Feather	Martin, S		Rapid Application of Lightweight Formal Methods for Consistency Analyses	Transactions on Software Engineering	IEEE		Volume 23	Number 11	949-959	36100	Consistency Checking, Formal Methods, Interface Checking, Test-Log Checking, Database-based Analysis	Two pilot studies investigate the feasibility of lightweight formal methods that employ a database as the underlying reasoning engine to perform the analyses. The studies address checking softare module interface descriptions, and analysis of test logs.	Martin.S.Feather@Jpl.Nasa.Gov

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Feinberg	Dr. Jerry M.	Dr. Patrick W. Goalwin, Pamela L. Mayne	A Detailed Look at Verification, Validation, and Accreditation (VV&A) Automated Support Tools	Proceedings of the 2001 Fall Simulation Interoperability Workshop	Simulation Interoperability Standards Orgranization					37135	verification, validation, accreditation, tools	This paper presents detailed analyses and recommendations to determine the state of the art in automated tools that can be used to support the verification, validation, and accreditation (VV&A) of simulations and federations.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Fenton	N. E	Shari Lawrence Pfleeger		Software Metrics: A rigorous and practical approach	PWS Publishing					1997		The bible of metrics	Stevenson/864-656-5880/steve@cs.clemson.edu
Ferziger	Joe H.	Peric, Milovan	Further Discussion of Numerical Errors in CFD	International Journal for Numerical Methods in Fluids				21-34		1995		Abstract: The methods of estimating numerical errors given in an earlier paper are extended in directions that make them useful in actual CFD applications. In particular, the method of estimating convergence error (the error due to insufficient iteration) is extended to allow the possibility of complex eigenvalues; an ad hoc method that can be applied to any case is also given. For the discretization error, which arises from the numerical approximation of the differential equation(s), methods that can be used on non-uniform drids are presented; they can be extended to unstructured grids as well. The utility of these methods is demonstrated for linear problems as well as solutions of the Navier-Stokes equations. The examples show that the estimation of errors is neither difficult nor expensive.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Feynman	Richard			The Character of Natural Law	MIT Press					May-05		The physicist's side of validation; esp. Ch 2	Stevenson/864-656-5880/steve@cs.clemson.edu
Fiadeiro	J. L.	T. Maibaum	Verifying for Reuse: Foundations of Object-Oriented System Verification	Proceedings of Theory and Formal Methods of Computing					235-257	Jun-05	verification, object oriented		
Figart	Grayden T.	Charles E. Hays	Verification, Validation, And Accreditation Of Hardware-In-The-Loop Systems	Proceedings of the 2001 International Test and Evaluation Association (ITEA) ITEA Modeling and Simulation Conference, December 3-6, 2001	International Test and Evaluation Association					37226	verification, validation, HWIL	This paper provides a practical approach for successful accreditation of HWIL systems within the existing VV&A framework. This paper demonstrates that accreditation is required for all non-tactical components of the HWIL system under the existing Department of Defense (DoD), Department of Navy (DoN), Commander Operational Test and Evaluation Force (COMOPTEVFOR), and Program Executive Office Theater Surface Combatants (PEO TSC) M&S and VV&A instructions. It recommends a tailoring of the existing PEO TSC M&S VV&A to accommodate the unique nature of HWIL systems.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Food and Drug Administration (FDA)			General Principles of Software Validation; Final Guidance for Industry and FDA Staff (Version 2.0, January 11, 2002) supercedes GUIDANCE FOR INDUSTRY: GENERAL PRINCIPLES OF SOFTWARE VALIDATION (Draft Guidance, Version 1.1 for comment) -- http://www.fda.gov/cdrh/comp/guidance/938.html (accessed August 2002).		U.S. Department of Health and Human Services, Food and Drug Administration, Center for Devices and RadiologicalHealth (June 1, 1997)					Jan-02	medical device, software validation	This guidance outlines general validation principles that the Food and Drug Administration (FDA) considers to be applicable to the validation of medical device software or the validation of software used to design, develop, or manufacture medical devices. This final guidance document, Version 2.0, supersedes the draft document, General Principles of Software Validation, Version 1.1, dated June 9, 1997.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu

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Fortin	A.	Jardak, M.; Gervais, J. J.; Pierre, R.	Localization of Hopf Bifurcations in Fluid Flow Problems	International Journal for Numerical Methods in Fluids			57		111-142	Jun-05		Abstract: This paper is concerned with the precise localization of Hopf bifurcations in various fluid flow problems. This is when a stationary solution loses stability and often becomes periodic in time. The difficulty is to determine the critical Reynolds number where a pair of eigenvalues of the Jacobian matrix crosses the imaginary axis. This requires the computation of the eigenvalues (or at least some of them) of a large matrix resulting from the discretization of the incompressible Navier-Stokes equations. We thus present a method allowing the computation of the smallest eigenvalues, from which we can extract the one with the smallest real part. From the imaginary part of the critical eigenvalue we can deduce the fundamental frequency of the time-periodic solution. These computations are then confirmed by direct simulation of the time-dependent Navier-Stokes equations.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Fossett	C.A.	D. Harrison, H. Weintrob, and S.I. Gass	An Assessment Procedure for Simulation Models: A Case Study		Operations Research, Vol 39, No. 5, pp. 710-723					13-Jun-05			From Old DMSO VV&A Bibliography:
Fossett	Christian A.	Dal Harrison, Harry Weintrob, and Saul I. Gass	An Assessment Procedure for Simulation Models: A Case Study		Operations Research, Vol. 39, No. 5, PP. 710-723					1990			From Old DMSO VV&A Bibliography:
Frankenfeld	Curtis A.	and Wayne T. Greybeal	Confidence Assessment of Strategic Defense System Simulation Models		Proceedings of the Summer Computer Simulation Conference in Calgary, Alberta, Canada, pp 1048-1053					1990	IV&V		From Old DMSO VV&A Bibliography: Valuable indication of "establishing" a VV&A process
Freedman	Daniel P.	Gerald M. Weinberg	Handbook of Walkthroughs, Inspections, and Technical Reviews: Evaluating Programs, Projects, and Products (3rd edition)		Dorset House Publishing (New York)					Jun-05			Priscilla Glasow
Freigassner	R.	Sarjoughian, H.S.	A Systems Approach to a Verification and Validation Methodology within the FEDEP Six-Step-Process.	Europe - Simulation Interoperability Workshop. 2001. London, UK	IEEE					2001			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Frye	CDR Charles	Sarah Aust and Scott Dunlap	A Web-Enabled Resource Center Provides Structure And Simulation Reusability	Proceedings of the 2002 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Organziation					Mar. 10-15, 2002	Process models, simulation, interoperability, verification, validation, tools	This paper describes an approach for improving decision support capability through discrete event simulation and web-enabled technology. The standard methodology incorporated and lessons learned described in this paper will be beneficial to any organization attempting to build and validate simulation-based decision support capability in today's dynamic environment.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Garmus	David H.	David Herron	Estimating Software Earlier and More Accurately	Crosstalk, June 2002	Journal of Defense Software Engineering		pp 18-21	Vol 15 No. 6	3	37408	Function Point Analysis, software estimating, cost, risk factors	Describes estimating software projects in terms of complexity, risk factors, etc.	Dave Hall; 760-446-4624;daveh@survice.com
Garmus	David H.	David Herron	Estimating Software Earlier and More Accurately	Crosstalk, June 2002	Journal of Defense Software Engineering		pp 18-21	Vol 15 No. 6	3	37408	Function Point Analysis, software estimating, cost, risk factors	Describes estimating software projects in terms of complexity, risk factors, etc.	Dave Hall; 760-446-4624;daveh@survice.com
Gerber	Richard	and Insup Lee	A Layered Approach to Automating the Verification of Real-Time Systems		IEEE Transactions on Software Engineering, Vol. 18, No. 9					1992	Verification		From Old DMSO VV&A Bibliography: Layered Approach to specificaiton and verification of real-time systems
Gergerenzer	Gerd			Calculated Risks: How to Know When Numbers Deceive You	Simon & Schuster	0-7432-0556-1			310	2002		This book is about the problem of comprehending and communicating risk to people who are not expert in statistics. He discusses the pervasive illusion of certainty and presents tools that can help people understand risk.	Hemsch
Glasow	Priscilla	Dale K. Pace	SIMVAL 99	PHALANX	Military Operations Research Society (MORS)			Vol. 32/No. 1	22-25	36220	simulation, validation, SIMVAL	Describes the MORS 1999 simulation validation (SIMVAL) workshop.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu

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Goalwin	Dr. Patrick W.	Dr. Jerry M. Feinberg, Pamela L. Mayne	A Detailed Look at Verification, Validation, and Accreditation (VV&A) Automated Support Tools	Proceedings of the 2001 Fall Simulation Interoperability Workshop	Simulation Interoperability Standards Orgranization					37135	verification, validation, accreditation, tools	This paper presents detailed analyses and recommendations to determine the state of the art in automated tools that can be used to support the verification, validation, and accreditation (VV&A) of simulations and federations.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Gordon	Rankin	Ron Pipes	Verification and Validation Methodology Guide, Vols. 1 & 2	Joint National Integration Center, Schriever AFB, CO, 80912-7300					250+	36616		This two volume set describes the methodology used at the Joint National Integration Center (JNIC) for conducting Verification and Validation (V&V) activities. Volume 1 describes V&V concepts and the process used at the JNIC to conduct V&V. Volume 2 describes the detailed V&V procedures developed at the JNIC that are selectively employed to meet the needs of the V&V customer.	Dr. Forrest Gibson / 719-567-9251 / Forrest.Gibson@jntf.osd.mil
Gosman	A.D.	Quality Assurance for Industrial CFD Codes	Quality Assurance for Industrial CFD Codes		AIAA				351-359	1996		Abstract: An overview is provided of the various factors which influence the quality of industrial CFD codes and the results which they produce. It is argued that important quality issues arise in the basic methodology development, in code assembly and in application. Discretization, physics modeling and input data errors are identified as the main contributors. Some suggestions are offered on how to reduce these.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Grady	Jeffrey O.		System Validation and Verification		CRC Press (Boca Raton, FL)					1998			Priscilla Glasow
Graebener	Robert J.	Robert F. Richbourg, Tim Stone, & Keith Green	Verification And Validation (V & V) Of Federation Synthetic Natural Environments	Proceedings of the Interservice/Industry Training, Simulation and Education Conference	National Training Systems Association (NTSA)					37196	verification, validation, synethic environment	This paper addresses V&V of federated synthetic environments.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Graham	A. J.	A. C. T. Drakeford and C. D. Turner	The Verification. Validation, and Testing of Object-Oriented Systems	BT Technology Journal			11	3	79-88	1993	verification, validation, testing, object oriented		
Green	Keith	Robert F. Richbourg, Robert J. Graebener & Tim Stone	Verification And Validation (V & V) Of Federation Synthetic Natural Environments	Proceedings of the Interservice/Industry Training, Simulation and Education Conference	National Training Systems Association (NTSA)					37196	verification, validation, synethic environment	This paper addresses V&V of federated synthetic environments.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Grenda	J.M.	Schwer, D. A.; Merkle, C. L.	Use of Analytical Solutions in Validating Unsteady CFD Codes		AIAA		44	8	1087-1099	Jun-05		Abstract: The validation of unsteady CFD codes by comparison with closed-form analytical solutions is discussed. The approach considers unsteady oscillatory solutions that grow or decay with time as in classical stability problems. The analytical solutions can be used to determine the accuracy of unsteady CFD computations. The first example is an unsteady shear layer with heat release, and the second example considers chamber oscillations characteristic of combustion instability. The solution procedures are straightforward and may be employed on a workstation or PC at minimum computational expense.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Gross	David	Scott Harmon, Dale Pace, and William Tucker	Why Fidelity?	Proceedings of the Spring 1999 Simulation Interoperability Workshop (SIW)	Simulation Interoperability Standards Organization (SISO) Simulation Interoperability Workshop (SIW)				on CD	March 15-19. 1999	fidelity, validation	Describes how the Simulation Fidelity Interim Study Group (ISG) is approaching simulation fidelity.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Gupta	Uma G.		Validation and Verification of Knowledge-Based Systems		IEEE Computer Society Press					Jun-05			From Old DMSO VV&A Bibliography:
Gustafson	Karl		Capturing Correct Solutions in CFD	Proceedings	Sixteenth International Conference on Numerical Methods in Fluid Dynamics		47	5	534-545	2000		Abstract: Computational simulations and corresponding theoretical analyses have recently led us to the following three issues concerning the relationships of numerical solutions to physical solutions. These are a new concept of numerical rotational release occurring in implicit schemes, a new view of the vorticity condition at the far field boundary which is seen to be grid related, and operator splitting errors as viewed through stencil exponentiations.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov

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Guyon	Gilles	Nadia Rahni	VALIDATION OF A BUILDING THERMAL MODEL IN CLIM2000 SIMULATION SOFTWARE USING FULL-SCALE EXPERIMENTAL DATA, SENSITIVITY ANALYSIS AND UNCERTAINTY ANALYSIS	Undated Website Paper: http://www.hvac.okstate.edu/pdfs/bs97/papers/P060.PDF (accessed August 2002)							experimental validation, uncertainty	Within the framework of full-scale experimental validation of the global building energy simulation software programme CLIM2000, an experimentation has been carried out in a 100 m² real house from Oct 95 to May 96. First, we compare the simulated results with the experimental results. Then, we applied two different screening methods (sensitivity analysis) to the model in order to exhibit the most influent parameters and to calculate the output confidence interval (uncertainty analysis), and to compare the pertinence of each method in terms of results precision and calculation time. The experimental results are compared with the output uncertainty in order to see if they are included in the confidence interval. .	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Hagar	J.		A Systems Approach to Software Testing and Reliability	10th Ann. Software Reliability Testing and Reliability.	IEEE					Jun-05		Hagar is one of the few industry people who write in the technical literature on V&V.	Stevenson/864-656-5880/steve@cs.clemson.edu
Halbwachs	Nicolas	Fabienne Lagnier and Christophe Ratel	Programming and Verifying Real-Time Systems by Means of the Synchronous Data-Flow Language LUSTRE		IEEE Transactions on Software Engineering, Vol. 18, No. 9, pp. 785 - 793					1992	Verification		From Old DMSO VV&A Bibliography: Use of Verification tool LESAR
Hall	Brian J.	Candace L. Conwell, Marcia A. Stutzman	FOCUSING ON CREDIBILITY AND CONFIDENCE - U.S. NAVY MODELING AND SIMULATION VERIFICATION, VALIDATION, AND ACCREDITATION	Proceedings of the 2000 Symposium on Performance Evaluation of Computer and Telecommunication Systems, SPECTS 2000	The Society for Computer Simulation International					July 16-20, 2000	Modeling, Simulation, Verification, Validation, Accreditation	This paper examines the M&S accreditation process the United States Navy's independent operational tester, Commander Operational Test and Evaluation Force (COMOPTEVFOR) employs to ultimately ensure a high level of confidence in the M&S used to supplement	Marcia Stutzman / (301) 317-9698 / mstutzman@logicon.com
Hall	Brian J.	Candace L. Conwell, Marcia A. Stutzman	Focusing on Credibility and Confidence - U.S. Navy Modeling and Simulation Verification, Validation, and Accreditation	Proceedings of the 2000 Summer Computer Simulation Conference	The Society for Computer Simulation International					July 16-20, 2000	Modeling, Simulation, Verification, Validation, Accreditation	This paper examines the M&S accreditation process the United States Navy's independent operational tester, Commander Operational Test and Evaluation Force (COMOPTEVFOR) employs to ultimately ensure a high level of confidence in the M&S used to supplement	Marcia Stutzman / (301) 317-9698 / mstutzman@logicon.com
Hall	Brian J.	Betsy B. Delong, Melissa O. Miller, Pamela L. Mayne, Marcia A. Stutzman	Recommended Levels of Verification and Validation for Modeling and Simulation Accreditation	Proceedings of the 2001 Summer Computer Simulation Conference	The Society for Computer Simulation International					July 15–19, 2001	Accreditation, Verification, Validation	This paper will examine available sources of information, summarize the findings, and present a preliminary recommendation regarding possible levels of verification and validation for accreditation in the Department of the Navy.	Betsy DeLong / (301) 744-4457 / delongbb@ih.navy.mil
Hall	Brian J.	Candace L. Conwell, Marcia A. Stutzman	VERIFICATION AND VALIDATION OF DISTRIBUTED TEST ENVIRONMENTS FOR NAVY OPERATIONAL TEST AND EVALUATION	Proceedings of the 2000 International Test and Evaluation Association International Symposium	International Test and Evaluation Associaton					September 5-7, 2000	Distributed Simulation, Distributed Test, M&S, Validation, Verification, Accreditation	This paper discusses the requirements to establish, verify and validate a distributed test environment prior to, and during use for OT&E. Additionally, this paper compares these evolving procedures with the Department of the Navy Verification, Validation,	Marcia Stutzman / (301) 317-9698 / mstutzman@logicon.com
Hall	Brian J.	Candace L. Conwell, Marcia A. Stutzman	Verification and Validation of Distributed Test Environments for Navy Operational Test and Evaluation	Proceedings of the 2000 International Test and Evaluation Association International Symposium	International Test and Evaluation Associaton					September 5-7, 2000	Distributed Simulation, Distributed Test, M&S, Validation, Verification, Accreditation	This paper discusses the requirements to establish, verify and validate a distributed test environment prior to, and during use for OT&E. Additionally, this paper compares these evolving procedures with the Department of the Navy Verification, Validation,	Marcia Stutzman / (301) 317-9698 / mstutzman@logicon.com
Hall	David H.	Michelle L. Kilikauskas, Dennis K. Laack, Dr. Paul R. Muessig, Barry O'Neal, Chester Richardson, Karl Simecka, Willie Stewart, Dr. Stewart W. Turner	How to VV&A Without Really Trying: SMART VV&A Lessons Learned		Joint Technical Coordinating Group on Aircraft Survivability (JTCG/AS)	JTCG/AS 97-M 009			118	Nov-97	VV&A, M&S, Credibility, Lessons Learned, VV&A Cost	A detailed exposition on lessons learned during the SMART program, which developed a cost-effective VV&A process for M&S used in system acquisition.	Dave Hall; 760-446-4624;daveh@survice.com
Hall	David H.	Michelle L. Kilikauskas, Dennis K. Laack, Dr. Paul R. Muessig, Barry O'Neal, Chester Richardson, Karl Simecka, Willie Stewart, Dr. Stewart W. Turner	How to VV&A Without Really Trying: SMART VV&A Lessons Learned		Joint Technical Coordinating Group on Aircraft Survivability (JTCG/AS)	JTCG/AS 97-M 009			118	Nov-97	VV&A, M&S, Credibility, Lessons Learned, VV&A Cost	A detailed exposition on lessons learned during the SMART program, which developed a cost-effective VV&A process for M&S used in system acquisition.	Dave Hall; 760-446-4624;daveh@survice.com
Hall	David H.	Hall, David H.; Kilikauskas, Michelle; Laack, Dennis K.; Muessig, Dr. Paul R.; O'Neal, Barry; Richardson, Chester; Simecka, Karl; Stewart, Willie; Turner, Stewart W.	How to VV&A Without Really Trying--SMART VV&A Lessons Learned		JTCG/AS				117	35735		This document is a summary of lessons learned during the Susceptibility Model Assessment and Range Test (SMART) Project, which developed and tested a comprehensive, cost-effective verification, validation and accreditation (VV&A) process for models and si	E. Ketcham/760-939-4251/ketchamej@navair.navy.mil

Lead Author Last Name	Lead Author First Name & MI	Other Authors	Item Title	Journal/Book Title	Publisher	ISBN/ISSN	Chapter or Volume	Edition/Issue (volume may be in column to left)	Pages	Publication Date	Keywords	Annotation (2-3 sentences about item significance)	Item submitted by (name/phone/email)
Hall	David H.		Statistical vs. Analytical Significance: How Much V&V is Enough?										E. Ketcham/760-939-4251/ketchamej@navair.navy.mil
Hanson	Kenneth M.		A Framework for Assessing Uncertainties in Simulation Predictions	Physica D			26	3	340-348	1996		Abstract: A probabilistic framework is presented for assessing the uncertainties in simulation predictions that arise from model parameters derived from uncertain measurements. A probabilistic network facilitates both conceptualizing and computationally implementing an analysis of a large number of experiments in terms of many intrinsic models in a logically consistent manner. This approach permits one to improve one's knowledge about the underlying models at every level of the hierarchy of validation experiments.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Harmon	S.Y.	Michael L. Metz	Using Subject Matter Experts for Results Validation of a Complex Theater Warfare Simulation	Proceedings of the 2001 Fall Simulation Interoperability Workshop	Simulation Interoperability Standards Orgranization					37135	validation, subject matter experts, JWARS	This paper addresses the planning for the use of Subject Matter Experts (SMEs) to support the results validation of the Joint Warfare System (JWARS).	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Hasselman	T.K.	Chrostowski, J. D.	Effects of Product and Experimental Variability on Model Verification of Automobile Structures		Society for Experimental Mechanics		118		226-236	Jun-05		Abstract: Experimental verification of a structural dynamic model requires vibration testing to obtain frequency response and model data. The data are used to refine the model and assess its predictive accuracy. Although the existence of product variability and experimental variability are acknowledged, they are typically ignored in the model verification process. Models are "tuned" to match a particular set of data, usually by trial and error, and used to evaluate structural performance deterministically. Predictive accuracy is assessed heuristically, if at all. This paper describes an effort to quantify product and experimental variability based on multiple tests of multiple automobiles of the same design. These data are used to evaluate the modeling uncertainty and predictive accuracy of structural dynamic models updated by statistical parameter estimation. Quantitative results on product variability and experimental variability are presented, along with their effects on the predictive accuracy of the model.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Hasselman	Timothy K.	David C. Zimmerman, and David L. Herendeen	An integrated FEA software capability for dynamic model validation and verification	AIAA Paper 99-1595 (AIAA Accession number 24886); Collection of Technical Papers. Vol. 4 (A99-24601 05-39)	AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference and Exhibit, St. Louis, MO					Apr. 12-15, 1999	verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Hatten	Les		The T Experiments: Errors in Scientific Software		IEEE Computational Science & Engineering				1651-1656	1995		Abstract: Extensive tests showed that many software codes widely used in science and engineering are not as accurate as we would like to think. Better software engineering practices would help solve this problem, but realizing that the problem exists is an important first step.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Hatton	Les		The T Experiments: Errors in Scientific Software	IEEE Computational Science and Engineering	IEEE				27-38	1997		You will love it or hate it. It is required reading!	Stevenson/864-656-5880/steve@cs.clemson.edu
Hatton	Les			Safer C: Developing Software for High-Integrity and Safety Critical Systems	McGraw Hill					1995		Tells it like it is. His put down of the "programmer as artist"is worth the price of the book.	Stevenson/864-656-5880/steve@cs.clemson.edu

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Haynes	T.S.	Reed, H. L.; Saric, W. S.	CFD Validation Issues in Transition Modeling		AIAA		33	10	1778-1787	1995		Abstract: Laminar•turbulent transition is highly initial•condition and operating•condition dependent. Finding careful, archival experiments for comparison is the main validation issue; few exist. The CFD formulations validated to date demonstrate that if the environment and operating conditions can be modelled and input correctly, the computations (nonlinear PSE and DNS) agree quantitatively with the experiments. Future challenges for validation include: Successful CFD simulations of available complete databases; CFD leadership in the identification, cataloging, and modeling of the effects of freestream disturbances; CFD leadership in the determination of relevant validation experiments for supersonic and hypersonic flows; careful validation experiments and CFD solutions for complex 3•D geometries; and simulations and validations for the high Reynolds numbers of flight.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Hays	Charles E.		Modeling And Simulation Designation Process For Verification, Validation, And Accreditation	Proceedings of the 2001 International Test and Evaluation Association (ITEA) ITEA Modeling and Simulation Conference, December 3-6, 2001	International Test and Evaluation Association					37226	verification, validation, accreditation, PEO TSC	This paper describes an M&S selection process for acquisition program Verification, Validation, and Accreditation, which focuses on the needs of the user and the resources of the acquisition program. The process is intended to be used upon approval by the (Navy) Program Executive Office Theater Surface Combatants (PEO TSC) and will be included in its upcoming PEO TSC VV&A Best Practices document.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Hays	Charles E.	Grayden T. Figart	Verification, Validation, And Accreditation Of Hardware-In-The-Loop Systems	Proceedings of the 2001 International Test and Evaluation Association (ITEA) ITEA Modeling and Simulation Conference, December 3-6, 2001	International Test and Evaluation Association					1-Dec-01	verification, validation, HWIL	This paper provides a practical approach for successful accreditation of HWIL systems within the existing VV&A framework. This paper demonstrates that accreditation is required for all non-tactical components of the HWIL system under the existing Department of Defense (DoD), Department of Navy (DoN), Commander Operational Test and Evaluation Force (COMOPTEVFOR), and Program Executive Office Theater Surface Combatants (PEO TSC) M&S and VV&A instructions. It recommends a tailoring of the existing PEO TSC M&S VV&A to accommodate the unique nature of HWIL systems.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Hegelsmann	R.	Mueller, U.; Troitzsch, K. G.	Modelling and Simulation in the Social Sciences from the Philosophy of Science Point of View		Kluwer Academic Publishers		SAND98-2420			20-Jun-05		Book Section: The World as a Process - Simulation in the Natural and Social Sciences by S. Hartmann. Abstract: Simulation techniques, especially those implemented on a computer, are frequently employed in natural as well as in social sciences with considerable success. There is mounting evidence that the "model-building era" that dominated the theoretical activities of the sciences for a long time is about to be succeeded or at least lastingly supplemented by the "simulation era". But what exactly are models? What is a simulation and what is the difference and the relation between a model and a simulation? These are some of the questions addressed in this article. I maintain that the most significant feature of a simulation is that it allows scientists to imitate one process by another process. "Process" here refers solely to a temporal sequence of states of a system. Given the obseration that processes are dealt with by all sorts of scientists, it is apparent that simulations prove to be a powerful interdisciplinarily acknowledged tool. Accordingly, simulations are best suited to investigat	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Heidemann	John	John Heidemann, Nirupama Bulusu, Jeremy Elson, Chalermek Intanagonwiwat, Kun-chan Lan, Ya Xu, Wei Ye, Deborah Estrin, and Ramesh Govindan	Effects of Detail in Wireless Network Simulation	roceedings of the SCS Multiconference on Distributed Simulation	SCS				37563	jan, 2001		wireless network simulation, verificaiton, and validation	Johnh@isi.edu

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Heidemann	John	John Heidemann, Kevin Mills, and Sri Kumar.	Expanding Confidence in Network Simulation	IEEE Network Magazine	IEEE		15	5	58-63	sep/oct, 2001		network simulation, verification and validation, summary of DARPA/NIST workshop	Johnh@isi.edu
Heidemann	John	Kevin Mills & Sri Kumar	Expanding Confidence in Network Simulation	USC/Information Sciences Institute Research Report 00-522, April 2000; submitted for publication to IEEE Computer	available from http://www.isi.edu/~johnh/PAPERS/Heidemann00c.pdf (accessed August 2002)						networking, validation, techniques	Abstract: Networking research increasingly depends on simulation to investigate new protocol behavior, performance, and interactions. In spite of wide use of simulation, today there is no common understanding of what level of simulation validation is required for these tasks, and limited back-ground of what validation techniques are being used and their effectiveness. This paper reports on discussions of these issues that arose from the Network Simulation Validation Workshop spon-sored by DARPA and NIST in May 1999. We describe best-current-practices of general validation and validation of TCP, how scale and validation interact, and workshop consensus.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Henry	David		Software Estimation: Perfect Practice Makes Perfect	Crosstalk, June 2002	Journal of Defense Software Engineering		pp 28-30	Vol 15 No. 6	3	Jun-02	Software Estimating, Examples	Discussion of how to train the pointy haired manager in estimating software projects	Dave Hall; 760-446-4624;daveh@survice.com
Henry	David		Software Estimation: Perfect Practice Makes Perfect	Crosstalk, June 2002	Journal of Defense Software Engineering		pp 28-30	Vol 15 No. 6	3	37408	Software Estimating, Examples	Discussion of how to train the pointy haired manager in estimating software projects	Dave Hall; 760-446-4624;daveh@survice.com
Henzinger	T.	Z. Manna and A. Pnueli	Temporal proof methodologies for real-time systems		Proceedings of the ACM Principles of Programming Languages					1991			From Old DMSO VV&A Bibliography:
Herendeen	David L.	Timothy K. Hasselman and David C. Zimmerman	An integrated FEA software capability for dynamic model validation and verification	AIAA Paper 99-1595 (AIAA Accession number 24886); Collection of Technical Papers. Vol. 4 (A99-24601 05-39)	AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference and Exhibit, St. Louis, MO					Apr. 12-15, 1999	verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Herskovitz	Paul J.		A Theoretical Framework for Simulation Validation: Popper's Falsificationism		International Journal of Modelling and Simulation, Vol. 11, no.2, pp.56-58					1991	Validation		From Old DMSO VV&A Bibliography: Theoretical assessment of validation
Hess	B. S.		Review of the Sea Control Analysis Tool (SCAT)		Center for Naval Analyses Research Memorandum 92-146 (920146.09)					1992			From Old DMSO VV&A Bibliography: Model review case history
Hill	MAJ Chris M.	Linda C. Malone	Interim Experiment Design Model -- A Verification and Validation Process for Training Simulations	PHALANK	Military Operations Research Society (MORS)	0195-1920	32	3	12-15	Sept. 1999	verification, validation, training simulators	Describes a structured approach to verification and validation of training simulators through interim experimentation.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Hillegas	Anne	John Backschies, Michael Donley, R.Clif Duncan, William Edgar	The Use of Modeling and Simulation (M&S) Tools in Acquisition Program Offices: Results of a Survey		Hicks & Associates, INC.				30	36922	M&S, Cost, Survey, DOT&E,	A survey of 22 acquisition programs (and 359 M&S) identifying the VV&A processes used and associated M&S costs.	Dave Hall; 760-446-4624;daveh@survice.com
Hillegas	Anne	John Backschies, Michael Donley, R.Clif Duncan, William Edgar	The Use of Modeling and Simulation (M&S) Tools in Acquisition Program Offices: Results of a Survey		Hicks & Associates, INC.				30	36922	M&S, Cost, Survey, DOT&E,	A survey of 22 acquisition programs (and 359 M&S) identifying the VV&A processes used and associated M&S costs.	Dave Hall; 760-446-4624;daveh@survice.com
Hilliard	Danielle P.		Navy Area TBMD – Adventures in Simulation-Based Missile Software Testing	Virtual World	Program Executive Office for Theater Surface Combatants Systems Engineer for Modeling and Simulation, Code TD1MS			Vol. 2, No. 3	4	36831	verification, validation, accreditation	The AEGIS Project office uses a process known as The Accreditation Control Panel (ACP), and through a series of Software Control Panels (SCP), the series of models, simulations and tactical hardware and software are evaluated. The STANDARD Missile Community continues to use a similar proven methodology when accepting hardware and software before an actual flight test that includes development of independent 6 Degrees of Freedom (DOF) simulations to verify the design, then applying one of those verified models to conduct performance testing of the missile computer hardware and software.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Hills	R. G.	and T. G. Trucano	Statistical Validation of Engineering and Scientific Models		Sandia National Laboratories, SAND Report99-1256					1999	Validation, Statistical, Engineering		Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Hills	R. G.	and T. G. Trucano	Statistical Validation of Engineering and Scientific Models with Application to CTH		Sandia National Laboratories, SAND Report2001-0312					2001	Validation, Statistical, Engineering		Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu

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Hills	Richard G.	Trucano, Timothy G	Statistical Validation of Engineering and Scientific Models: A Maximum Likelihood Based Metric		Sandia National Laboratories, SANDIA Report SAND2001-1783		SAND2001-1783			37257	Validation, Statistical, Engineering		Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Hills	Richard G.	Trucano, Timothy G	Statistical Validation of Engineering and Scientific Models: Background		Sandia National Laboratories		NUREG/CR-6311 LA-12915-MS			1995		Abstract: A tutorial is presented discussing the basic issues associated with propagation of uncertainty analysis and statistical validation of engineering and scientific models. The propagation of uncertainty tutorial illustrates the use of the sensitivity method and the Monte Carlo method to evaluate the uncertainty in predictions for linear and nonlinear models. Four example applications are presented; a linear model, a model for the behavior of a damped spring•mass system, a transient thermal conduction model, and a nonlinear transient convective•diffusive model based on Burger's equation. Correlated and uncorrelated model input parameters are considered. The model validation tutorial builds on the material presented in the propagation of uncertainty tutorial and uses the damp spring•mass system as the example application. The validation tutorial illustrates several concepts associated with the application of statistical inference to test model predictions against experimental observations. Several validation methods are presented including error band based, multivariate, sum of squares of residual	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Hodak	Gary. W.	and Janet Weisenford Healy	Improvement to OPNAVINST 5000.50A and the Training Device Management Information System (TRADMIS)		Naval Training Systems Center Special Report 91-006					1991			From Old DMSO VV&A Bibliography:
Hodges	James	and James Dewar	Is It Your or Your Model Talking? A Framework for Model Validation		Rand, R-4114-RC/AF					1992			From Old DMSO VV&A Bibliography: Argues that some M&S are not validable and should be regarded as such
Holden	M.S.	Moselle, J. R.; Sweet, S. J.; Martin, S. C.	A Database of Aerothermal Measurements in Hypersonic Flow for CFD Validation		AIAA		12	5	940-948	1996		Abstract: This paper presents an experimental database selected and compiled from aerothermal measurements obtained in hypersonic flow on simple model configurations on which fundamental flow phenomena could be most easily examined. The experimental studies were conducted at Mach numbers between 6 and 18 in the Calspan shock tunnels and the Large Energy National Shock (LENS) facility. The measurements selected for this database were assembled from a much larger data set by choosing only the measurements in laminar, transitional, and turbulent flows, which are of the greatest value for code validation, and for which the model and flowfield boundary conditions are well established. A computer program, "CUBDAT," was constructed specifically to provide easy access to the model and freestream measurements in the database, as well as the means to plot the measurements and compare them with imported data. The database contains diagrams of model configurations and tabulations of freestream conditions, measurements of heat transfer, pressure, and skin friction for each of the studies sel	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Holland	John H.	Keith J. Holyoak, Richard E. Nisbett, Paul R. Thagard		Induction: The Processes of Inference, Learning, and Discovery	MIT Press	0-262-58096-9			398	1989		This book presents a broad, sweeping inquiry of what concepts are, what learning is, and how it can take place at all. It is a deep synthesis of epistemology, evolution, and computation. (Hofstader). Anyone who attempts to communicate V&V or statistics or risk will find this book extremely enlightening	Hemsch

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Hoope	T.		Aspects of Incremental Knowledge Validation		Proceedings of the First Workshop on "Validation, Verification and Test of KBS", ECAI90 (Stockholm)					1990			From Old DMSO VV&A Bibliography:
Hoover	Lt. Alex (USN)		From V&V to A	Proceedings of the 2001 International Test and Evaluation Association (ITEA) ITEA Modeling and Simulation Conference, December 3-6, 2001	International Test and Evaluation Association					37226	verification, validation, accreditation	This paper describes an Accreditation process that was developed to asses the effectiveness of using a meta-federation within the Command and Control System Module (CCSM) Off-Hull Assembly and Test Site (COATS) facility to provide an early operational assessment of the Virginia Class submarine CCSM.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Hopkinson	Bill	Jackie Zheqing Zhang and Sheau-Dong Lang	Static Analysis and Validation of Composite Behaviors in Composable Behavior Technology	Proceedings of the 2002 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Organziation					Mar. 10-15, 2002	validation	The goal of our research was to implement a tool that performs static analysis and validation of the behaviors defined using the CBT for ModSAF. Using advanced XML and JAVA technologies, together with graph algorithms, we developed a tool called LogicChecker to provide static behavior validation for behaviors created using the CBT methodology. Our static validation techniques perform assessment on the basis of the characteristics of the static model design and source code, prior to machine execution.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Hoppe	T.		Hypotheses Generation for Knowledge Validation		Proceedings of the 9th European Conference on Artificial Intelligence, ECAI90 (Stockholm), pp. 354-356					Jun-05			From Old DMSO VV&A Bibliography:
Hoppe	T.		Validation of User Intention		in Current Trends in Knowledge Acquisition, Frontiers in Artificial Intelligence and Applications, B. Wiellinga, et al. (eds) IOS Press, Amsterdam					1990			From Old DMSO VV&A Bibliography:
Howden	William E.		Validation of Scientific Systems	ACM Computing Surveys	ACM				193-228	Jun-05		Early discussion.	Stevenson/864-656-5880/steve@cs.clemson.edu
Hughes	Wayne P. (Editor)		Military Modeling for Decision Making (3rd edition)		Military Operations Research Society					1997			Priscilla Glasow
Humphrey	Watts S.		Managing The Software Process		Addison-Wesley Publishing Company. ISBN 0-2201-18095-2					1990	Software Engineering, V&V, Configuration Management, Quality Assurance		From Old DMSO VV&A Bibliography: Valuable overview of software development from the Software Engineering Institute
Humphreys	Watt S.			Managing the Software Process	Addison-Wesley					1989		The beginnings of CMM and personal software process.	Stevenson/864-656-5880/steve@cs.clemson.edu
Hunter	N. E	P. Barney, C. Ferregut, L. Perez, and T. Paez	Statistical Validation of Stochastic Models	Proceedings of the 15ht International Modal Analysis Conference, SEM, Orlando, FA 1997						1997			Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Hyams	D.	C. Burg, K. Sreenivas and B. Mitchell	Unstructured Nonlinear Free Surface Flow Solutions: Validation and Verification	AIAA Paper 2002-2977	32nd AIAA Fluid Dynamics Conference and Exhibit						verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Ince	Darrel			An Introduction to Software Quality Assurance and its Implementation	McGraw Hill					1994		Readable	Stevenson/864-656-5880/steve@cs.clemson.edu
Izquierdo	Maria del Mar	Gilles Lefebvre, Elena Palomo, Fabrice Boudaud, & Alexandre Jeandel	A Statistical Methodology for Model Validation in the ALLAN.TM Simulation Environment	Undated Website Paper: http://www.hvac.okstate.edu/pdfs/bs95/papers/BS95_085_93.pdf (accessed August 2002)							statistical validation	Abstract: This paper deals with the model validation methodology used at the Gaz de France Research & Development Division. The primary emphasis is on the latest developments, concerning different statistical methods for model validation and diagnosis. The corresponding computer implementation is called DVM standing for "Diagnostic et Validation de Modeles".	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu

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James	G.	P. Willett, R.C. Glen, A. R. Leach, and R. Taylor	Development and Validation of a Genetic Algorithm for Flexible Docking, available at http://www.ncbi.nlm.nih.gov/htbin-post/Entrez/query?uid=9126849&form=6&db=m&Dopt=b (accessed September 2002)	Journal of Molecular Biology (J Mol Biol) 1997 Apr 4;267(3):727-48			267	3	727-748	Apr 4. 1997	genetic algorithm, validation	Prediction of small molecule binding modes to macromolecules of known three-dimensional structure is a problem of paramount importance in rational drug design (the "docking" problem). We report the development and validation of the program GOLD (Genetic Optimisation for Ligand Docking).	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Jameson	Antony	Martinelli, Luigi	Mesh Refinement and Modeling Errors in Flow Simulation	AIAA Journal			36	5	665-667	Jun-05		Abstract: This paper presents a perspective on verification and validation of computational fluid dynamics tools for analysis and design. It identifies principal sources of error due to approximations in the physical model, numerical discretization, and implementation. Issues in algorithm design and tradeoffs between modeling accuracy and computational costs are discussed. Computational examples are drawn from the authors' work.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Jones	Capers		Software Cost Estimation in 2002	Crosstalk, June 2002	Journal of Defense Software Engineering		pp 4-8	Vol 15 No. 6	5	Jun-02	Software Estimating Tools, software development, costs	Details the evolution of software estimating tools from the 1960's to the present	Dave Hall; 760-446-4624;daveh@survice.com
Jones	Capers		Software Cost Estimation in 2002	Crosstalk, June 2002	Journal of Defense Software Engineering		pp 4-8	Vol 15 No. 6	5	Jun-02	Software Estimating Tools, software development, costs	Details the evolution of software estimating tools from the 1960's to the present	Dave Hall; 760-446-4624;daveh@survice.com
Jones	T. Capers			Software Quality: Analysis and Guidelines for Success						Jun-05		Oft quoted author. Book is impossible to find.	Stevenson/864-656-5880/steve@cs.clemson.edu
Jordan	Jack	Michael L. Metz	Verification Of Object-Oriented Simulation Designs	Proceedings of the 2001 Winter Simulation Conference	Society for Computer Simulation International					Dec-01	verification, JWARS	This paper discusses the verification process for object oriented simulation high-level and detailed designs based on the authors experience with the Joint Warfare System (JWARS).	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Kaindl	Hermann	Stefan Kramer	Verification, Improvement and Validation of Knowledge-based Systems (ViVa): References on V&V of Knowledge-based Systems	ESPRIT Project 6125 (TN-703.1.0-WP1100-SOE); accessible at http://spd-web.terma.com/Projects/ViVa/TN-703.html (accessed September 2020)	The ViVa Consortium					95-08-02	KBS, V&V, bibliography	KBS, V&V, bibliography	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Kameny	Iris		Database Technology Assessment for Modeling and Simulation Presented 11 August 1992 To the Defense Science Board Summer Study on Modeling and Simulation		Rand Memorandum WD-6166-DR&E prepared for Director, Defense Research and Engineering					1992	Verification, Validation, Accreditation		From Old DMSO VV&A Bibliography: Discusses Data VV&A
Kammeyer	Mark E.		Wind Tunnel Facility Calibrations and Experimental Uncertainty		AIAA		NASA-GB-001-97			1997		Abstract: The impact of facility calibrations on wind tunnel test results is addressed. It is shown that this error source can be the dominant contributor to the total experimental uncertainty. Examples are presented for transonic and supersonic cases, demonstrating the inclusion of this term without the introduction of false correlations among error sources. The importance of documentation detailing the uncertainty analysis is emphasized.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Kandelin	A. N.	D. E. O'Leary	Verification of Object-Oriented Systems: Domain Dependent and Domain-Independent Approaches	Journal of Systems and Software			29		261-269	1995	verification, object oriented		
Kasputis	Stephen	Ng, H.C.	Composable Simulations	Proceedings of the 2000 Winter Simulation Conference						2000			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Keck	Eric		JADS Accreditation Methodologies	Proceedings of the 1999 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Orgranization					36220	accreditation	The focus of this paper is on the accreditation portion of the process associated with those three strategies. The accreditation process used for each of the three tests will be described, followed by a discussion of the lessons learned and pros and cons of each.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Kemmerer	Richard A.		Integrating Formal Methods into the Development Process		IEEE Software, Vol. 7, No. 5, pp. 37-50					1990			From Old DMSO VV&A Bibliography:

Lead Author Last Name	Lead Author First Name & MI	Other Authors	Item Title	Journal/Book Title	Publisher	ISBN/ISSN	Chapter or Volume	Edition/Issue (volume may be in column to left)	Pages	Publication Date	Keywords	Annotation (2-3 sentences about item significance)	Item submitted by (name/phone/email)
Ketcham	Ronald L.	Muessig, Dr. Paul R.	Software Engineering and Simulation Credibility	Proceedings of the 2000 Summer Computer Simulation Conference	Society for Computer Simulation International	1-56555-208-3			6	July 16-20 2000	Software Engineering, Software Quality Assurance, Configuration Management, Requirements Management	This paper demonstrates that significant insights into simulation credibility can be obtained via detailed examination of the software engineering processes and practices by which the simulation was developed and maintained. The nature and value of good	R. Ketcham/760-939-2363/ketchamrl@navair.navy.mil
Ketcham	Ronald L.	Maj. Steven Bishop, Edited by Krzystof Amborski and Hermann Meuth	The Application of VV&A in Promoting the Credible Employment of M&S within the Joint Strike Fighter Program	Proceedings of the 2002 European Simulation Multiconference	Society for Computer Simulation Europe		pp 705 – 709		5	37408	VV&A, JSF, M&S, Credibility	Processes used and lessons learned in conducting VV&A activities for M&S in support of an aircraft development program.	Dave Hall; 760-446-4624;daveh@survice.com
Ketcham	Ronald L.	Maj. Steven Bishop, Edited by Krzystof Amborski and Hermann Meuth	The Application of VV&A in Promoting the Credible Employment of M&S within the Joint Strike Fighter Program	Proceedings of the 2002 European Simulation Multiconference	Society for Computer Simulation Europe		pp 705 – 709		5	37408	VV&A, JSF, M&S, Credibility	Processes used and lessons learned in conducting VV&A activities for M&S in support of an aircraft development program.	Dave Hall; 760-446-4624;daveh@survice.com
Kilikauskas	Michelle L.	Edited by Krzystof Amborski and Hermann Meuth	Establishing the Credibility of Rolling Airframe Missile Simulations for Use in Operational Testing: Lessons in Process from a Success Story in VV&A	Proceedings of the 2002 European Simulation Multiconference	Society for Computer Simulation Europe				5	37408	VV&A, RAM, M&S, Credibility	Processes used and lessons learned in conducting VV&A activities for engineering level M&S in support of a missile development program.	Dave Hall; 760-446-4624;daveh@survice.com
Kilikauskas	Michelle L.	Edited by Krzystof Amborski and Hermann Meuth	Establishing the Credibility of Rolling Airframe Missile Simulations for Use in Operational Testing: Lessons in Process from a Success Story in VV&A	Proceedings of the 2002 European Simulation Multiconference	Society for Computer Simulation Europe				5	37408	VV&A, RAM, M&S, Credibility	Processes used and lessons learned in conducting VV&A activities for engineering level M&S in support of a missile development program.	Dave Hall; 760-446-4624;daveh@survice.com
Kilikauskas	Michelle L.	Hall, David H.	Obstacles to Success in VV&A Efforts and How to Overcome Them	Proceedings of the 15th European Simulation Multiconference		1-56555-225-3			4	Jun-01		This paper discusses the key execution issues encountered by JASA over ten years of applying VV&A policy and principles and offers lessons learned on either avoiding the problems or dealing with them when they occur.	M. Kilikauskas/760-939-8468/kilikauskaml@navair.navy.mil
Kilikauskas	Michelle L.		The SMART Road to Accreditation: Lessons from the Front	Proceedings of the Second International SimTect Conference	SimTecT Organising Committee	0 646 31199 9			53	35490		This paper summarizes keys to cost effective, meaningful accreditation derived from experience working with missile, aircraft, and electronic warfare systems programs in various stages of the systems acquisition cycle.	M. Kilikauskas/760-939-8468/kilikauskaml@navair.navy.mil
Kleijnen	J.P.C.		Chapter 6: Experimental Design for Sensitivity Analysis, Optimization, and Validation of Simulation Models		John Wiley & Sons		NASA-GB-002-95			Jun-05		Series Title: Handbook of Simulation: Principles, Methodology, Advances, Application, and Practice; Series editor: Banks, J.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Kleijnen	J.P.C.		Sensitivity Analysis and Related Analyses: A Review of Some Statistical Techniques	Journal of Statistical and Computational Simulations			AIAA Paper No. 95-2273			Jun-05		Abstract: This paper reviews five related types of analysis, namely (1) sensitivity or what•if analysis, (ii) uncertainty or risk analysis, (iii) screening, (iv) validation, and (v) optimization. The main questions are: when should which type of analysis be applied; which statistical techniques may then be used? This paper claims that the proper sequence to follow in the evaluation of simulation models is as follows. 1) Validation, in which the availability of data on the real system determines which type of statistical technique to use for validation. 2) Screening: in the simulation's pilot phase the really important inputs can be identified through a novel technique, called sequential bifurcation, which uses aggregation and sequential experimentation. 3) Sensitivity analysis: the really important inputs should be subjected to a more detailed analysis, which includes interactions between these inputs; relevant statistical techniques are design of experiments (DOE) and regression analysis. 4) Uncertainty analysis: the important environmental inputs may have values that are not p	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov

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Kleijnen	J.P.C.		Statistical Validation of Simulation Models	European Journal of Operational Research			SAND98-2041			1998		Abstract: Rigorous statistical validation requires that the responses of the model and the real system have the same expected values. However, the modeled and actual responses are not comparable if they are obtained under different scenarios (environmental conditions). Moreover, data on the real system may be unavailable; sensitivity analysis can then be applied to find out whether the model inputs have effects on the model outputs that agree with the experts' intuition. Not only the total model, but also its modules may be submitted to such sensitivity analyses. This article illustrates these issues through a case study, namely a simulation model for the use of	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Kleijnen	J.P.C.	Bettonvil, Bert; Van Groenendahl, Willem	Validation of Trace-Driven Simulation Models: Regression Analysis Revisited	1996 Winter Simulation Conference Proceedings			AIAA Paper No. 96-0669			1996		Abstract: For the validation of trace•driven simulation models this paper recommends a simple statistical test that uses elementary regression analysis in a novel way. This test concerns a (joint) null•hypothesis: the outputs of the simulated and the real systems have the same means and the same variances. Technically, the differences between simulated and real outputs are regressed on their sums, and the resulting slope and intercept are tested to be zero. This paper further proves that it is wrong to use a naive test that regresses the simulation outputs on the real outcomes, and hypothesizes that the resulting regression line gives a 45 degree line through the origin. The new and the old tests are investigated in Monte Carlo experiments with inventory systems. The conclusion is that the new test has the correct type I error probability, whereas the old test (falsely) rejects a valid simulation model substantially more often than the nominal alpha level. The power of the new test increases, as the simulation model deviates more from the real system.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Kleijnen	J.P.C.		Verification and Validation of Simulation Models	European Journal of Operational Research			25	37477	181-193	1997		Abstract: This paper surveys verification and validation of models, especially simulation models in operations research. For verification it discusses 1) general good programming practice (such as modular programming), 2) checking intermediate simulation outputs through tracing and statistical testing per module, 3) statistical testing of final simulation outputs against analytical results, and 4) animation. For validation it discusses 1) obtaining real•world data, 2) comparing simulated and real data through simple tests such as graphical, Schruben•Turing, and t tests, 3) testing whether simulated and real responses are positively correlated and moreover have the same mean, using two new statistical procedures based on regression analysis, 4) sensitivity analysis based on design of experiments and regression analysis, and risk or uncertainty analysis based on Monte Carlo Sampling, and 5) white versus black box simulation models. Both verification and validation require good documentation, and are crucial parts of assessment, credibility, and accreditation. A bibliogra	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Kleindorfer	G.B.	O'Neill, L.; Ganeshan, R.	Validation in Simulation: Various Positions in the Philosophy of Science	Management Science			36	5	687-695	1998			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov

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Kliejnen	Jack P.C.	and Gustav A. Alink	Validation of Simulation Models: Mine-Hunting Case-Study		Department of Information Systems and Auditing, Katholieke Universiteit Brabant (Tilburg University), P.O. Box 90153, 5000 LE Tilburg, Netherlands. Report # (Kenmerk) 320.92.152					1992			From Old DMSO VV&A Bibliography:
Kliejnen	Jack P.C.		Verification and Validation of Simulation Models		Department of Information Systems and Auditing, Katholieke Universiteit Brabant (Tilburg University), P.O. Box 90153, 5000 LE Tilburg, Netherlands. Report # (Kenmerk) 320.93.186					1993			From Old DMSO VV&A Bibliography:
Klir	George, J		Architecture of Systems Problem Solving.		Plenum Press					1985			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Knaus	Rodger		First Steps Toward Neural Net V&V	RIACS V&V Workshop						Dec. 2000	neural net, V&V, ANN	This work was sponsored by the Turner Fairbank Highway Research Center, FHWA, and was performed by Instant Recall Inc. on project "Verification and Validation of Neural Nets", [contract DTFH61-97--00243, requisition 42-02-7036/0000]: Principal Investigator: Rodger Knaus; COTR: James Wentworth, PE; ANNs: Prof. Larry Medsker, American University; statistics: Prof. Olga Codero-Braña; lit. search: Dr. Camille Motta	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Knepell	Peter L.	and Deborah C. Arangno	Simulation Validation: A Confidence Assessment Methodology		IEEE Computer Society Press					1993			From Old DMSO VV&A Bibliography:
Knepell	Peter L.	Deborah C. Arangno		Simulation Validation: A confidence Assessment Methodlogy	IEEE Computer Press					1993		Seminal attempt to score simulations	Stevenson/864-656-5880/steve@cs.clemson.edu
Knight	John	Colleen L. DeJong, Matthew S. Gibble and Luis G. Nakano	Why are Formal Methods Not Used More Widely?	4th NASA Langley Formal Methods Workshop	NASA					Jun-05		Puts to cop-outs on FMs by showing case studies of how FM worked in practice.	Stevenson/864-656-5880/steve@cs.clemson.edu
Köster	Andreas	Dirk Brade	Risk-based Validation & Verification Levels Definition	Proceedings of the 2001 European Simulation Interoperability Workshop	Simulation Interoperability Standards Orgranization					Jun-01	verification, validation	Following the CLIMB example V&V levels or credibility levels are defined that are related to the criticality of the user's simulation based decision.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Kurshan	R.P.		Program Verification	Notices of the American Mathematical Society			AIAA Paper No. 95-2226			1995			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Laack	Dennis K.	*CSC	A Comparative Analysis of Tri-Service Accreditation Policies and Practices--Volume I of the Accreditation Requirements Study Report		JTCG/AS				89	34366			E. Ketcham/760-939-4251/ketchamej@navair.navy.mil
Laack	Dennis K.	*CSC	Information Requirements in Support of Accreditation--Volume II of the Accreditation Requirements Study Report		JTCG/AS				41	34366			E. Ketcham/760-939-4251/ketchamej@navair.navy.mil

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Lajolo	M.	L. Lavagno, M. Rebaudengo, M. Sonza Reorda,& M. Violante	Automatic Test Bench Generation for Simulation-based Validation	Undated website paper: http://www-cad.eecs.berkeley.edu/~polis/paper/2000/codes00_2.pdf (accessed August 2002)							architecture validation, simulation-based validation	Abstract: In current design practice synthesis tools play a key role, letting designers to concentrate on the specification of the system being designed by carrying out repetitive tasks such as architecture synthesis and technology mapping. However, in the new design flow, validation still remains a challenge: while new technologies based on formal verification are only marginally accepted for large designs, standard techniques based on simulation are beginning to fall behind the increased system complexity. This paper proposes an approach to simulation-based validation, in which an evolutionary algorithm computes useful input sequences to be included in the test bench. The feasibility of the proposed approach is assessed with a preliminary implementation of the proposed algorithm.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Lang	Sheau-Dong	Jackie Zheqing Zhang and Bill Hopkinson	Static Analysis and Validation of Composite Behaviors in Composable Behavior Technology	Proceedings of the 2002 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Organziation					Mar. 10-15, 2002	validation	The goal of our research was to implement a tool that performs static analysis and validation of the behaviors defined using the CBT for ModSAF. Using advanced XML and JAVA technologies, together with graph algorithms, we developed a tool called LogicChecker to provide static behavior validation for behaviors created using the CBT methodology. Our static validation techniques perform assessment on the basis of the characteristics of the static model design and source code, prior to machine execution.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Langevine	Ludovic	Pierre Deransart, Mireille Ducassé, & Erwan Jahier	RR-4342 - Tracing Execution of CLP(FD) Programs : A Trace Model and an Experimental Validation Environment	INRIA website paper (undated): http://www.inria.fr/rrrt/rr-4342.html (accessed August 2002)	INRIA						CONSTRAINT PROGRAMMING / LOGIC PROGRAMMING / PROGRAMMING ENVIRONMENT / DEBUGGING / TRACING / TRACE ANALYSIS / ANALYSIS TOOL / PERFORMANCE DEBUGGING / VISUALIZATION / PROPAGATION ANALYSIS	Abstract : Developing and maintaining Constraint Logic Programs (CLP) requires performance debugging tools based on visualization and explanation. However, existing tools are built in an ad hoc way and porting them from one platform to another is very difficult and experimentation of new tools remains limited. It has been shown in previous work that, from a fine-grained execution trace, a number of interesting views about logic program executions could be generated by trace analysis. In this report, we propose a generic trace model for constraint resolution by narrowing and a methodology to study and improve it. The trace model is the first one proposed for and does not pretend to be the ultimate one. The methodology is based on the following steps: definition of a formal model of trace, extraction of relevant informations by a trace analyzer, utilization of the extracted informations in several debugging tools. We present the trace model and an implementation which includes a tracer, based on a meta-interpreter written in ISO-Prolog, and an opium-like analyzer. Th	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Laskey	K.B.		Model Uncertainty: Theory and Practical Implications	IEEE Transactions on Systems, Man and Cybernetics-Part A: Systems and Humans						2001		Abstract: A model is a representation of a system that can be used to answer questions about the system. In many situations in which models are used, there exists no set of universally accepted modeling assumptions. The term model uncertainty commonly refers to uncertainty about a model's structure, as distinguished from uncertainty about parameters. This paper presents alternative formal approaches to treating model uncertainty, discusses methods for using data to reduce model uncertainty, presents approaches for diagnosing inadequate models, and discusses appropriate use of models that are subject model uncertainty.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Laverty	Michelle	Mark Schroeder, and Jonathan Gordon-Smith	A Non-Traditional Approach to Simulation Testing		Proceedings of the 1992 Summer Computer Simulation Conference in Reno, Nevada, pp. 946-950					1992			From Old DMSO VV&A Bibliography: Different approach to V&V

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Law	A. M.	W. D. Kelton	Chapter on Validation	Simulation Modeling and Analysis (3rd Edition)	McGraw-Hill, New York			Third Edition	264-291	2000			
Law	Averill M.		How to Build Valid, Credible and Appropriately Detailed Simulation Models		Industrial Engineering, Vol. 22, No. 4, pp. 16-17					1990	Valid, Credible		From Old DMSO VV&A Bibliography: Useful Point in explaining open problem definition
Law	Averill M.	W. David Kelton	Simulation Modeling and Analysis		McGraw Hill			3rd Edition		2000	Simulation, Verification, Validation, Analysis, Modeling	The textbook on simulation and modeling	Dave Hall; 760-446-4624;daveh@survice.com
Lee	James R.		Certainty in Stockpile Computing: Recommending a Verification and Validation Program for Scientific Software		Sandia National Laboratories		AIAA 2000-2549			2000		Abstract: As computing assumes a more central role in managing the nuclear stockpile, the consequences of an erroneous computer simulation could be severe. Computational failures are common in other endeavors and have caused project failures, significant economic loss, and loss of life. This report examines the causes of software failure and proposes steps to mitigate them. A formal verification and validation program for scientific software is recommended and described.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Lee	L.H.	Poolla, K.	On Statistical Model Validation	Journal of Dynamic Systems, Measurement and Control			1		9	1998		Abstract: In this paper we formulate a particular statistical model validation problem in which we wish to determine the probability that a certain hypothesized parametric uncertainty model is consistent with a given input•output data record. Using a Bayesian approach and ideas from the field of hypothesis testing, we show that in many cases of interest this problem reduces to computing relative weighted volumes of convex sets in Rn (where N is the number of uncertain parameters). We also present and discuss a randomized algorithm based on gas kinetics, as well as the existing Hit•and•Run family of algorithms, for probable approximate computation of these volumes.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Lee	Michael D.	Bradford S. Canova, Peter H. Christensen, Bruce R. Tripp, Michael H. Pack, David L. Pack	Simulation To Support Operational Testing: A Practical Application	Proceedings of the 1999 Winter Simulation Conference	Society for Computer Simulation International					36495	verification, validation, Predator SRAW	This paper describes a combined effort between the Marine Corps Systems Command (MARCORSYSCOM), the Marine Corps Operational Test and Evaluation Activity (MCOTEA) and the MITRE Corporation to exploit M&S to support Operational Test (OT) of the Predator Short Range Assault Weapon (SRAW).	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
LeFebre	John		VV&A Requirements Traceability Using DOORS	Proceedings of the 2001 International Test and Evaluation Association (ITEA) ITEA Modeling and Simulation Conference, December 3-6, 2001	International Test and Evaluation Association					Dec-01	verification, validation, accreditation, requirements traceability	This paper will describe a hierarchy that relates usage requirements and measures to M&S requirements, acceptance criteria and M&S V&V results. It will show how this hierarchy provides the traceability necessary to determine the impact of VV&A on usage results. It will also show how it supports follow-on M&S accreditation efforts. It will describe how a requirements traceability tool is being used to control M&S requirements for the Cooperative Engagement Capability (CEC) Program Office, define the hierarchy, trace VV&A efforts, and provide visibility to VV&A participants and sponsors.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Legge	Gaynor W.	and Dana L. Wyatt	A Software Mechanism to Enhance Simulation Model Validity		Proceedings of the 1992 Winter Simulation Conference in Arlington, VA (to be pub)					Jun-05			From Old DMSO VV&A Bibliography:

Lead Author Last Name	Lead Author First Name & MI	Other Authors	Item Title	Journal/Book Title	Publisher	ISBN/ISSN	Chapter or Volume	Edition/Issue (volume may be in column to left)	Pages	Publication Date	Keywords	Annotation (2-3 sentences about item significance)	Item submitted by (name/phone/email)
Lentz	Geri	Ronald W. Arlund	Live, Virtual, and the Path to Data Correlation	Proceedings of the 2002 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Organziation					Mar. 10-15, 2002	VV&A, legacy simulation, live test, data correlation, operator-in-the-loop, output validation, system of systems, Joint Integrated Air Defense System, JIADS, cruise missile defense	This paper outlines the process developed by the Joint Cruise Missile Defense (JCMD) Joint Test Force (JTF) to use data from field tests employing actual combat systems, in the validation of a legacy simulation federation. The objective of these efforts is to ensure the models used for the Joint Test and Evaluation (JT&E) simulation events are credible for analyzing cruise missile defense in a joint environment	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Leveson	Nancy		Software Safety: What, Why and How	ACM Computing Surveys					125-163	1986		Seminal article in area	Stevenson/864-656-5880/steve@cs.clemson.edu
Lewis	Robert O.		A Systems Approach Methodology for Verification, Validation, and Accreditation of Models and Simulations		General Research Corp. for Software Engineering Dividsion - CREO Memorandum CR-01-2090 Prepared for The Deputy Under Secretary of the Army for Operations Research					1992			From Old DMSO VV&A Bibliography:
Lewis	Robert O.		Independent Verification and Validation: A Life Cycle Engineering Process for Quality Software		Wiley Series in New Dimensions in Engineering . John Wiley & Sons					1992			From Old DMSO VV&A Bibliography:
Lewis	Robert O.		Verification, Validation, and Accreditation (VV&A) of Models and Simulations Used in Distributed Interactive Environments		Proceedings of the European Simulation Multiconference (ESM)					1993			From Old DMSO VV&A Bibliography:
Littlewood	Bev	and Lorenzo Strigini	The Risks of Software		Scientific American, pp. 62-75					1992			From Old DMSO VV&A Bibliography: Discusses Fundementals of software reliability
Ljung	L.	Guo, L.	Estimating the Total Model Error from a Standard Validation Test		IEEE		1		420-429	1998		Abstract: The problem of assessing the quality of a given, or estimated model is a central issue in system identification. Various new techniques for estimating bias and variance contributions to the model error have been suggested in the recent literature. In this contribution, classical model validation procedures are placed at the focus of our attention. We discuss the principles by which we reach confidence in a model through such validation techniques, and also how the distance to a "true" description can be estimated this way. In particular we stress how the typical model validation procedure gives a direct measure of the model error of the model test, without referring to its ensemble properties. Several model error bounds are developed for various assumptions about the disturbances entering the system.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Locatelli	J.	and J. C. Sourisseau	Validation of In-House and External Software Systems at Aerospatiale		NATO Advisory Group for Aerospace Research and Development (AGARD) Report No. 772 Analytical Qualification of Aircraft Structure. NTIS, paper #2					Jun-05	validation		From Old DMSO VV&A Bibliography: Generic
Lopez	B.	P. Meseguer and E. Plaza	Knowledge Based Systems Validation: A State of the Art		AICOM, Vol. 3, No. 2, pp. 58-72					1990			From Old DMSO VV&A Bibliography:

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Lotz	Heinz-Bernd	Dirk Brade and Richard Maguire	Arguments-based Credibility Levels	Proceedings of the 2002 European Simulation Interoperability Workshop	Simulation Interoperability Standards Organziation					June 24-26, 2002	Verification, Validation, Levels, Credibility, Model Decomposition, Claims-Arguments-Evidence Concept	Continuing the credibility indicators approach we presented during the Euro-SIW 2001, we decomposed the claim of validity and correctness of an M&S in numerous sub-claims. For each sub-claim, we identified commonly used arguments for its validity or correctness and assigned them to the credibility categories or levels. Additionally, we have defined minimum requirements for the probative force of evidence for each credibility level.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Lumley	J.L.	Van Dyke, M.	Annual Review of Fluid Mechanics	Annual Reviews, Inc					231-236	Jun-05		Reference Type: Book Section; Author: Roache, P. J.; Title: Quantification of Uncertainty in Computational Fluid Dynamics; Abstract: This review covers verification, validation, confirmation and related subjects for computational fluid dynamics (CFD), including error taxonomies, error estimation and banding, convergence rates, surrogate estimators, nonlinear dynamics, and error estimation for grid adaptation vs. quantification of uncertainty.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Lynn	Verne L.	Paul Drolihet, Jr., Dr. Peter Cherry, Dr. William Evers, Edward Brady, and Joseph Fox (cont.)	Report of Army Science Board 1991 Summer Study - "Army Simulation Strategy"		Department of the Army - Army Science Board					1991	Simulation Strategy		From Old DMSO VV&A Bibliography: Vision of the electronic battlefield
Maguire	Richard	Dirk Brade and Heinz-Bernd Lotz	Arguments-based Credibility Levels	Proceedings of the 2002 European Simulation Interoperability Workshop	Simulation Interoperability Standards Organziation					June 24-26, 2002	Verification, Validation, Levels, Credibility, Model Decomposition, Claims-Arguments-Evidence Concept	Continuing the credibility indicators approach we presented during the Euro-SIW 2001, we decomposed the claim of validity and correctness of an M&S in numerous sub-claims. For each sub-claim, we identified commonly used arguments for its validity or correctness and assigned them to the credibility categories or levels. Additionally, we have defined minimum requirements for the probative force of evidence for each credibility level.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Mansir	MAJ Joe	Sharon R. Nichols, Michael L. Metz, CDR Steven “Boots” Barnes	The Joint Warfare System (Jwars) Assessment Process	Proceedings of the 2001 International Test and Evaluation Association (ITEA) ITEA Modeling and Simulation Conference, December 3-6, 2001	International Test and Evaluation Association					37226	verification, validation, accreditation, JWARS	This paper describes that assessment process that includes developmental test and evaluation (DT&E); verification and validation (V&V); Beta testing; and a planned operational test and evaluation (OT&E).	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Marchand	Gary J.		A Never Ending Story The Need For Verification and Validation Throughout the Life of a Test	Proceedings of the 1999 Fall Simulation Interoperability Workshop	Simulation Interoperability Standards Orgranization					36404	verification, validaiton	This paper will discuss the difficulty involved in verifying and validating a complex synthetic environment involving satellite transmission of data and the need to complete some steps of the verification and validation (V&V) during the actual testing. In addition, it will discuss the value of V&V during the conduct of the test as a measure of the synthetic environment’s test readiness.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Marchand	Gary J.		Verification And Validation Of The Jads End-To-End Test	Proceedings of the 1999 International Test and Evaluation Association Modeling and Simulation Workshop	International Test and Evaluation Association					Dec-99	verification, validation, JADS	This paper discusses the difficulty involved in verifying and validating a complex synthetic environment involving satellite transmission of data and the need to complete some steps of the verification and validation (V&V) during the actual testing because of the inability to replicate the test environment in the laboratory. In addition, it discusses the value of V&V during the conduct of the test as a measure of the synthetic environment’s test readiness. Conducting V&V activities prior to a test demonstrates to the tester that the synthetic environment can meet the test	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Marciniak	John J.	and Donald J. Reifer	Software Acquisition Management		John Wiley & Sons, Inc. ISBN 0-471-50643-5					Jun-05	Quality Assurance		From Old DMSO VV&A Bibliography:
Marcon	Eric		A Program Evaluation and Validation Tool for the Automation of Sequential Discrete Process Built upon a Discrete Event Simulator		Proceedings of the 1992 Summer Computer Simulation Conference in Reno, Nevada, pp. 110-114					Jun-05			From Old DMSO VV&A Bibliography: Concerns simulating manufacturing processes

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Martin Marietta			Confidence Methodology Guide, Third Edition, Final		National Test Bed Technical Report NTB-237 022-06-02, Prepared for Strategic Defense Initiative Organization, Washington. D.C.					Jun-05			From Old DMSO VV&A Bibliography:
Marvin	J. G.		CFD Validation for Forebody Inlet Interactions		NASA Ames Research Center for the Computational Fluid Dynamics Code Validation/Calibration JANNAF Airbreathing Propulsion Subcommittee Workshop - High-Speed Inlet Forebody Interactions (The Johns Hopkins University) NTIS, pp. 271-294					Jun-05	Validation		From Old DMSO VV&A Bibliography: Has Roadmap for code validation
Marvin	Joseph G.		Perspective on Computational Fluid Dynamics Validation	AIAA Journal			1		249-259	Jun-05		Abstract: A comprehensive to computational fluid dynamics (CFD) validation is presented. Requirements from computational and experimental perspectives are given. Experimental validation is emphasized because it ultimately determines the accuracy of CFD modeling and its application to complex problems. The concepts of building block and benchmark experiments are introduced. The types of measurements required of these experiments and their accuracy determination are explained. Contributions from such experiments toward the development and validation of CFD are reviewed and examples provided. Future challenges and strategies for validation are discussed.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Marvin	Joseph G.	Dinesh K. Prabhu, Michael J. Wright, James L. Brown, and Ethiraj Venkatapathy	X-33 aerothermal design environment predictions - verification and validation	AIAA Paper 2000-2686 (AIAA Accession number 33735)	AIAA Thermophysics Conference, 34th, Denver, CO					June 19-22, 2000	verification, validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Mayne	Pamela L.	Dr. Patrick W. Goalwin, Dr. Jerry M. Feinberg,	A Detailed Look at Verification, Validation, and Accreditation (VV&A) Automated Support Tools	Proceedings of the 2001 Fall Simulation Interoperability Workshop	Simulation Interoperability Standards Orgranization					37135	verification, validation, accreditation, tools	This paper presents detailed analyses and recommendations to determine the state of the art in automated tools that can be used to support the verification, validation, and accreditation (VV&A) of simulations and federations.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Mazel	Dr. David S.	CMDR William P. Ervin, LCDR Harry M. Croyder	SPY-1D(V) Models and Simulations Support Operational Testing in a Remote New Jersey Cornfield	Program Manager	Defense Systems Management College			Vol. XXVI, No. 5 DSMC 140	132	Sep-Oct 97	operational testing, modeling and simulation, verification, validation, accreditation process	Accredited models and simulations made land-based testing of the SPY-1 radar family more credible than ever before.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com

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McKay	M.D.		Evaluating Prediction Uncertainty		Los Alamos National Laboratory		SAND2000-3101					Abstract: The probability distribution of a model prediction is presented as a proper basis for evaluating the uncertainty in a model prediction that arises from uncertainty in input values. Determination of important model inputs and subsets of inputs is made through comparison of the prediction distribution with conditional prediction probability distributions. Replicated Latin hypercube sampling and variance ratios are used in estimation of the distributions and in construction of importance indicators. The assumption of a linear relation between model output and inputs is not necessary for the indicators to be effective. A sequential methodology which includes an independent validation step is applied in two analysis applications to select subsets of input variables which are the dominant causes of uncertainty in the model predictions. Comparison with results from methods which assume linearity shows how those methods may fail. Finally, suggestions for treating structural uncertainty for submodels are presented.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
McKee	Dr. Larry		Verification and Validation of Distributed Air-to-Air Missile Tests	Proceedings of the 1999 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Orgranization					Mar-99	verification, validaiton	This paper describes the modified verification and validation approach used during the SIT testing. This approach incorporated qualitative comparisons between the ADS results and the live fire results and quantitative comparisons between the ADS results and stand-alone HWIL results. The quantitative validation method involved first establishing the validity of the missile HWIL lab results in its stand-alone configuration and then using the stand-alone HWIL lab as a source of validation data for the linked results.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
McWherter-Payne,	Mary A.	Christopher J. Roy and William L. Oberkampf	verification and validation for laminar hypersonic flowfields	AIAA Paper 2000-2550 (AIAA Accession number 33883)	Fluids 2000 Conference and Exhibit, Denver, CO					June 19-22, 2000	verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Mealy	Gregory L.	Arwen M. Warlock	Dynamic System Model Validation And Simulation	Proceedings of the 2000 Society For Computer Simulation Conference	Society for Computer Simulation International					1-Jul-00	validation	The Airframe Coefficient Estimation System (ACES) implements a parameter estimation–based model validation approach applicable to nonlinear dynamical system models. Model parameter estimates are determined as corrections to an a priori model by processing measured system response in an extended Kalman filter (EKF).	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Mehta	U.B.		Credible Computational Fluid Dynamics Simulations	AIAA Journal						19-Jun-05		Abstract: This summary presents the motivation for the Special Section on the credibility of computational fluid dynamics (CFD) simulations, its objective, its background and context, its content, and its major conclusions. Verification and validation (V&V) are the processes for establishing the credibility of CFD simulations. Validation assesses whether correct things are performed, and verification assesses whether they are performed correctly. Various aspects of V&V are discussed. Progress is made in verification of simulation models. Considerable effort is needed for assessing the validity of simulated reality.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov

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Mehta	U.B.		Guide to Credible Computer Simulations of Fluid Flows	Journal of Propulsion and Power			AIAA Paper No. 96-2053		11	1996		Abstract: The significance of computer simulations depends solely on their credibility. A user of computer products, simulations and software, expects that these products are credible for the intended use. Because no standards exist for fluid•flow simulations by which to establish this credibility, a guide is presented here. The credibility is established by conducting verification and validation of simulation models and certification of simulations and of simulation software. Verification assesses whether the problem is solved correctly and estimates the level of computational accuracy of simulations; validation determines whether the right problem is solved and assesses the level of the validity of the simulation model by estimating the degree to which simulations accurately represent reality. These processes are achieved by identifying the intended uses of the simulations and the sources of uncertainties in them and by conducting sensitivity • uncertainty analyses. Certification determines 1) whether a software in terms of its logic, conceptual and computational models, proced	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Mehta	Unmeel B.		Aerospace plane design Challenge: Credible Computations	Journal of Aircraft, Vol. 30, No. 4, July-August 1993, pp. 519-525.			30	4	519-525	July-Aug 1993			Unmeel B. Mehta
Mehta	Unmeel B.		Credible computational Fluid Dynamics Simulations	AIAA Journal, Vol. 36, No. 5, May 1998, pp.665-667			36	5	665-667	35916			Unmeel B. Mehta
Mehta	Unmeel B.		Guide to Credible Computer simulations of Fluid Flows	Journal of Propulsion and Power, Vol.12, No. 5, September-October 1996, pp. 940-948.			12	5	940-948	Sept-Oct 1996			Unmeel B. Mehta
Mehta	Unmeel B.		Some Aspects of Uncertainty in Computational Fluid Dynamics Results	Journal of Fluids Engineering, Transactions of the ASME, Vol.113, December 1991, pp. 538-543.			113		538-543	33573			Unmeel B. Mehta
Mesarovíc	Mihajlo.D	Takahara, Y.	General Systems Theory: Mathematical Foundation.		New York: Academic Press					1975			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Metz	Michael L.		Joint Warfare System (JWARS) Verification And Validation Lessons Learned	Proceedings of the 2000 Winter Simulation Conference	Society for Computer Simulation International					36861	verification, validation, accreditation, JWARS	This paper describes the lessons learned during the conduct of the effort including: the JWARS V&V process, the JWARS V&V Plan, reports delivered, and results to date. Special emphasis is on the use of the DoD VV&A Recommended Practices Guide as a basis of JWARS V&V planning and procedures and the evolution of the JWARS V&V Integrated Product Team.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Metz	Michael L.		Risk Reduction in the Simulation Development Process: JWARS V&V Examples	Proceedings of the 2001 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Orgranization					36951	verification, validation, JWARS	This paper describes the JWARS V&V effort as an example of how V&V can help reduce risk in a simulation development process.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Metz	Michael L.	S.Y. Harmon	Using Subject Matter Experts for Results Validation of a Complex Theater Warfare Simulation	Proceedings of the 2001 Fall Simulation Interoperability Workshop	Simulation Interoperability Standards Orgranization					37135	validation, subject matter experts, JWARS	This paper addresses the planning for the use of Subject Matter Experts (SMEs) to support the results validation of the Joint Warfare System (JWARS).	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Metz	Michael L.		Using Test And Evaluation Data As A Simulation Results Validation Referent	Proceedings of the 2001 International Test and Evaluation Association (ITEA) ITEA Modeling and Simulation Conference, December 3-6, 2001	International Test and Evaluation Association					37226	verification, validation, accreditation, JWARS	This paper addresses the issues related to using test results as a referent for conducting results validation of simulations, specifically theater level simulations, from the perspective of a verification and validation (V&V) practitioner.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Metz	Michael L.		Verification & Validation Of The Joint Warfare System (JWARS) Conceptual Model	Proceedings of the 2000 Society For Computer Simulation Conference	Society for Computer Simulation International					36708	verification, validation, JWARS, conceptual model	This paper, written from the V&V Agent's perspective, describes the elements of the JWARS Conceptual Model as they were assembled together by the V&V Agent, the V&V activities associated with them, and the results to date.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Metz	Michael L.	Jack Jordan	Verification Of Object-Oriented Simulation Designs	Proceedings of the 2001 Winter Simulation Conference	Society for Computer Simulation International					37226	verification, JWARS	This paper discusses the verification process for object oriented simulation high-level and detailed designs based on the authors experience with the Joint Warfare System (JWARS).	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com

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Metz	Michael L.	Sharon R. Nichols, MAJ Joe Mansir, CDR Steven “Boots” Barnes	The Joint Warfare System (Jwars) Assessment Process	Proceedings of the 2001 International Test and Evaluation Association (ITEA) ITEA Modeling and Simulation Conference, December 3-6, 2001	International Test and Evaluation Association					37226	verification, validation, accreditation, JWARS	This paper describes that assessment process that includes developmental test and evaluation (DT&E); verification and validation (V&V); Beta testing; and a planned operational test and evaluation (OT&E).	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Meyers	G. J.			The Art of Software Testing	Wiley					Jun-05		Still the bible	Stevenson/864-656-5880/steve@cs.clemson.edu
Miller	Melissa O.	Pamela L. Mayne	Measures of Effectiveness and Measures of Performance and Verification, Validation, and Accreditation Acceptability Criteria	Proceedings of the 2001 Summer Computer Simulation Conference	The Society for Computer Simulation International					July 15–19, 2001	Measure of Performance, Measure of Effectiveness, Acceptability Criteria, Standard	In this paper the authors examine the hypothesis that the development process of measures of effectiveness (MOEs) and measures of performance (MOPs) for systems can be generalized and applied to model and simulation acceptability criteria development.	Betsy DeLong / (301) 744-4457 / delongbb@ih.navy.mil
Mitchell	B.	C. Burg, K. Sreenivas, and D. Hyams	Unstructured Nonlinear Free Surface Flow Solutions: Validation and Verification	AIAA Paper 2002-2977	32nd AIAA Fluid Dynamics Conference and Exhibit						verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Morgan	Clarence Todd		Virtual Simulation and Joint Experimentation - STOW and Joint Attack Operations	Proceedings of the 1999 International Test and Evaluation Association Modeling and Simulation Workshop	International Test and Evaluation Association					Dec-99	verification, validation, accreditation, STOW	J9901 STOW Federation V&V was conducted in two dedicated 2 day sessions in May 99 with J9 and Service observers. The results of these V&V sessions saw some J9901 assumptions being revised based upon Service observer input to better bound the experiment.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Morgan	Terri Coutts	LCDR James H. Dick	Validation Of The Joint Simulation System: A Collaborative Approach	Proceedings of the 1999 International Test and Evaluation Association Modeling and Simulation Workshop	International Test and Evaluation Association					Dec-99	verification, validation, JSIMS	This paper addresses the collaborative methodologies being employed to complete the validation of JSIMS. It describes the validation paradigm developed and discuss the methods employed to complete the validation of JSIMS for the joint user	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
MSIAC			Verification, Validation and Accreditation (VV&A) Automated Support Tools: A State of the Art Report Part 1		Modeling and Simulation Information Analysis Center (MSIAC)				44	36875	V&V Automated Tools, V&V, M&S	A survey of automated tools for V&V	Dave Hall; 760-446-4624;daveh@survice.com
MSIAC			Verification, Validation and Accreditation (VV&A) Automated Support Tools: A State of the Art Report Part 1		Modeling and Simulation Information Analysis Center (MSIAC)				44	Dec-00	V&V Automated Tools, V&V, M&S	A survey of automated tools for V&V	Dave Hall; 760-446-4624;daveh@survice.com
Muessig	Dr. Paul R.		A “SMART” Approach to VV&A										E. Ketcham/760-939-4251/ketchamej@navair.navy.mil
Muessig	Dr. Paul R.	Laack, Dennis R.	Accreditation of Survivibility M&S	Aircraft Survivability	JTCG/AS			Winter 1995				This article describes SMART's approach to accreditation support for M&S based on over 3 years of experience in V&V.	D. Hall/760-939-8474/halldh@navair.navy.mil
Muessig	Dr. Paul R.	Laack, Dennis R.; Wrobleski, John J.	An Integrated Approach to Evaluating Simulation Credibility	Proceedings of the 2000 Summer Computer Simulation Conference	Society for Computer Simulation International	1-52555-208-3			9	July 16-20 2000	Model Credibility;Model Evaluation; Verification; Validation; Accreditation	This paper identifies and categorizes a spectrum of information that can be used to evaluate simulation credibility more robustly than reliance on validation results alone. It also describes a method by which the nature, scope, and depth of information n	D. Laack/ 805-987-9641 ext 130
Muessig	Dr. Paul R.	Laack, Dennis R.	Cost Effective VV&A: Five Prerequisites										E. Ketcham/760-939-4251/ketchamej@navair.navy.mil
Muessig	Dr. Paul R.		Cost vs. Credibility: How Much V&V is Enough?										E. Ketcham/760-939-4251/ketchamej@navair.navy.mil
Muessig	Dr. Paul R.	Laack, Dennis R.; Wrobleski, John J.	Optimizing the Selection of VV&A Activities A risk/Benefit Approach	Proceedings of the 1997 Summer Computer Simulation Conference	Society for Computer Simulation International	1-56555-123-0			6	July 13-17 1997	Verification; Validation; Model Credibility; Decision Making; Risk Analysis	This paper outlines a risk/benefit analysis approach to the selection of an optimal set of VV&A activities. The approach is an adaptation of MIL-STD-882C to the requirements of establishing the credibility of models and simulations.	D. Laack/ 805-987-9641 ext 130
Muessig	Dr. Paul R.		SMART Comes of Age	Aircraft Survivability	JTCG/AS			Winter 1995				This article describes how the Susceptibility Model Assessment and Range Test (SMART) Project's accreditation support process is being applied to real programs with real accreditation requirements across the Services, and what this expansion of SMART's ca	D. Hall/760-939-8474/halldh@navair.navy.mil

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Muessig	Paul R.	Dennis R. Laack; John J. Wrobleski	An Integrated Approach to Evaluating Simulation Credibility	Proceedings of the 2000 Summer Computer Simulation Conference	Society for Computer Simulation				7	2000	V&V, Credibility, M&S	A ridk based approach to V&V. The primary objective is to reduce the costs of V&V activities and focus those activities on the areas of highest benefit to the user.	Dave Hall; 760-446-4624;daveh@survice.com
Muessig	Paul R.	Dennis R. Laack; John J. Wrobleski	An Integrated Approach to Evaluating Simulation Credibility	Proceedings of the 2000 Summer Computer Simulation Conference	Society for Computer Simulation				7	2000	V&V, Credibility, M&S	A risk based approach to V&V. The primary objective is to reduce the costs of V&V activities and focus those activities on the areas of highest benefit to the user.	Dave Hall; 760-446-4624;daveh@survice.com
Muessig	Paul R.		Cost vs. Credibility: How Much V&V Is Enough?		Society for Computer Simulation						V&V, Cost, M&S	A study of the cost of V&V activities during the SMART program; tracked V&V cost via a detailed Work Breakdown Structure (WBS). The only detailed information available on historical V&V costs.	Dave Hall; 760-446-4624;daveh@survice.com
Muessig	Paul R.		Cost vs. Credibility: How Much V&V Is Enough?		Society for Computer Simulation						V&V, Cost, M&S	A study of the cost of V&V activities during the SMART program; tracked V&V cost via a detailed Work Breakdown Structure (WBS). The only detailed information available on historical V&V costs.	Dave Hall; 760-446-4624;daveh@survice.com
Muessig	Paul R.	Dennis R. Laack; John J. Wrobleski	Optimizing the Selection of VV&A Activities: A Risk/Benefit Approach	Proceedings of the 1997 Summer Computer Simulation Conference	Society for Computer Simulation		pp 855-860		6	1997	Risk, Benefit, VV&A, Resources, Cost	A detailed description of the JASA approach to establishing VV&A task and resource requirements using a risk/benefit approach	Dave Hall; 760-446-4624;daveh@survice.com
Muessig	Paul R.	Dennis R. Laack; John J. Wrobleski	Optimizing the Selection of VV&A Activities: A Risk/Benefit Approach	Proceedings of the 1997 Summer Computer Simulation Conference	Society for Computer Simulation		pp 855-860		6	1997	Risk, Benefit, VV&A, Resources, Cost	A detailed description of the JASA approach to establishing VV&A task and resource requirements using a risk/benefit approach	Dave Hall; 760-446-4624;daveh@survice.com
Muessig	Paul R.	David H. Hall; Dennis R. Laack; Martha L. Hoppus; Barry O'Neal	VV&A from A to Z		Joint Technical Coordinating Group on Aircraft Survivability (JTCG/AS)	JTCG/AS 97-M 008			167	35704	V&V, VV&A, M&S, Credibility, Work Breakdown Structure, WBS	A detailed and cost-effective process for M&S VV&A in support of DoD Acquisition Programs. Contains a detailed WBS for VV&A activities, allowing costs of V&V to be tracked.	Dave Hall; 760-446-4624;daveh@survice.com
Muessig	Paul R.	David H. Hall; Dennis R. Laack; Martha L. Hoppus; Barry O'Neal	VV&A from A to Z		Joint Technical Coordinating Group on Aircraft Survivability (JTCG/AS)	JTCG/AS 97-M 008			167	35704	V&V, VV&A, M&S, Credibility, Work Breakdown Structure, WBS	A detailed and cost-effective process for M&S VV&A in support of DoD Acquisition Programs. Contains a detailed WBS for VV&A activities, allowing costs of V&V to be tracked.	Dave Hall; 760-446-4624;daveh@survice.com
Muessig	Paul R.	Hall, David H.; Kilikauskas, Michelle; Laack, Dennis K.; Muessig, Dr. Paul R.; O'Neal, Barry; Richardson, Chester; Simecka, Karl	VV&A From A to Z--A SMART approach to VV&A for Acquisition M&S		JTCG/AS				167	35704		This document describes in detail a set of recommended steps that lead to a logically sound and justifiable accreditation decision for simulations used in acquisition applications.	E. Ketcham/760-939-4251/ketchamej@navair.navy.mil
Mugridge	Chris		Verification, Validation and Accreditation of Models and Simulations Used for Test and Evaluation: A Risk/Benefit Based Approach		Defence Evaluation and Research Agency, UK				30	36220	V&V, Risk, M&S	A risk-based approach to V&V. The primary objective is to reduce the costs of V&V activities and focus those activities on the areas of highest benefit.	Dave Hall; 760-446-4624;daveh@survice.com
Mugridge	Chris		Verification, Validation and Accreditation of Models and Simulations Used for Test and Evaluation: A Risk/Benefit Based Approach		Defence Evaluation and Research Agency, UK				30	36220	V&V, Risk, M&S	A risk-based approach to V&V. The primary objective is to reduce the costs of V&V activities and focus those activities on the areas of highest benefit.	Dave Hall; 760-446-4624;daveh@survice.com
Murray	Lynee D.	Vittorio Ricci	Measurement Error And Verification, Validation, & Accreditation		Simulation Interoperability Standards Organziation 2002 Fall Simulation Interoperability Workshop					Sept. 8-13, 2002	Measurement error, risk, statistics, time sampling	This paper illustrates the process of evaluating measurement error in Low to Moderate Risk computer simulations used in training Unmanned Surface Vehicle operations.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Murray	Lynee D.		A Brief Overview of Formal Methods for Verification &Validation	Proceedings of the 2002 Advanced Simulation Technologies Conference (ASTC), April 14-18, 2002	Society for Computer Simulation International						formal methods, verification, validation	This paper briefly overviews a variety of formal methods that may be used in the V & V portion of the model and simulation life cycle process. This overview serves as a useful reminder of bivariate statistics already mastered while helping in establishing a common vocabulary.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Muscietta	D. C.	M. A. Vincent, J. G. Thomas, and B. W. Bradley	Phase I Accreditation Efforts for the AMSAA Low Energy Laser Weapon Simulation (LELAWS)		Army Materiel Systems Analysis Activity (AMSAA) Briefing, LELAWS 1992					1991	Accreditaiton, Verification, Validation		From Old DMSO VV&A Bibliography: AMSAA Accreditation efforts for LELAW Simulation
Myjak	M.D.		RTI Interoperability Study Group Final Report	Simulation Interoperability Workshop. 1999. Orlando, FL	IEEE		Vol.1		p. 1-29	1999			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu

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Narasimhan	Naren	Ravi Kalyanaraman and Ranga Vemuri	Validation of Synthesized Register-Transfer Level Designs Using Simulation and Formal Verification	Undated website paper: http://www.ececs.uc.edu/~ddel/projects/dss/hldvt/ (accessed August 2002)							faormal validation, verification	As high-level synthesis systems become more sophisticated and synthesized designs get more complex, it is important that we develop a systematic approach to the validation of synthesized RTL designs. In this paper, we present our efforts to validate RTL designs generated by a high-level synthesis system, the Distributed Synthesis System (DSS). DSS accepts algorithmic behavioral specifications written in a subset of VHDL and generates a register transfer level design, also expressed in VHDL. Functional validation of a synthesized design can be accomplished through two basic approaches: Simulation and Formal Verification. The validation methodology described in this paper can be quite easily used in the context of other high-level synthesis systems as well.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
NASA			Formal Methods Specification and Verification Guidebook for Software and Computer Systems: Volume I, Planning and Technology Insertion		NASA		36	5	668-675	Jun-05		Abstract: Formal Methods (FM) consist of a set of techniques and tools based on mathematical modeling and formal logic that are used to specify and verify requirements and designs for computer systems and software. The use of FM on a project can assume various forms, ranging from occasional mathematical notation embedded in English specifications, to fully formal specifications using specification languages with a precise semantics. At their most rigorous, FM involve computer•assisted proofs of key properties regarding the behavior of the system. Project managers choose from this spectrum of FM options as appropriate to optimize the costs and benefits of FM use and to achieve a level of verification that meets the customer's needs and budget constraints. Experience suggests that these choices are most successful if based on certain managerial and technical considerations, which are the major focus of the guidebook. FM play an important role in many activities including certification, reuse, and assurance. Although the focus of this guidebook is restricted to the role of FM	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
NASA			Formal Methods Specification and Verification Guidebook for Software and Computer Systems: Volume II, A Practitioner's Companion		NASA		36	5	742-751	20-Jun-05		Abstract: This volume presents technical issues involved in applying mathematical techniques known as Formal Methods to specify and analytically verify aerospace and avionics software systems. The first volume in this two•part series, NASA•GB•002•95 [NASA•95a], dealt with planning and technology insertion. This second volume discusses practical techniques and strategies for verifying requirements and high•level designs for software intensive systems. The discussion is illustrated with a realistic example based on NASA's Simplified Aid for EVA (Extravehicular Activity) Rescue [SAFER94a, SAFER94b]. The volume is intended as a "companion" and guide for the novice formal methods and analytical verification practitioner. Together, the two volumes address the recognized need for new technologies and improved techniques to meet the demands inherent in developing increasingly complex and autonomous systems. The support of NASA's Safety and Mission Quality Office for the investigation of formal methods and analytical verification techniques reflects the growing practicali	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Nelson	Francine N.	Gregaory A. McIntyre	A Validation Assessment of THUNDER 6.5"s Intelligence, Surveillance, and Reconnaissance Module	Military Operations Research	Military Operations Research Society (MORS)	0275-5823	5	1	55-70	Jun-05	validation, THURDER, ISR	Describes a validation assessment of THUNDER 6.5 ISR module.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu

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Ng	Wai Y.	and Hoaang Tran-Duc	Validation of a Reactor Model for a Nuclear Power Plant Training Simulator		Proceedings of the 1991 Summer Computer Simulation Conference in Baltimore, MD, pp. 982-987					1991			From Old DMSO VV&A Bibliography:
Nichols	Sharon R.	Michael L. Metz, MAJ Joe Mansir, CDR Steven “Boots” Barnes	The Joint Warfare System (Jwars) Assessment Process	Proceedings of the 2001 International Test and Evaluation Association (ITEA) ITEA Modeling and Simulation Conference, December 3-6, 2001	International Test and Evaluation Association					Dec-01	verification, validation, accreditation, JWARS	This paper describes that assessment process that includes developmental test and evaluation (DT&E); verification and validation (V&V); Beta testing; and a planned operational test and evaluation (OT&E).	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
NRC			Modeling and Simulation in Manufacturing and Defense Acquisition: Pathways to success		Washington DC: National Research Council, National Academy Press								Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
NRC: Committee on Ship-Bridge Simulation Training, National Research Council			Simulation and Simulator Validity and Validation	Chapter 7 in Simulated Voyages: Using Simulation Technology to Train and License Mariners, Committee on Ship-Bridge Simulation Training, National Research Council (National Academy Press, 1996); available from http://books.nap.edu/books/0309053838/html/158.html#pagetop (accessed August 2002).	National Academy Press		7		158-172	Jun-05	simulator V&V	simulator V&V	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Nucci	M.C.		The Role of Symmetries in Solving Differential Equations	Mathematical and Computer Modelling			29		126-160	1997		Abstract: A review of the role of symmetries in solving differential equations is presented. After showing some recent results on the application of classical Die point symmetries method is presented. Finally, it is shown that iterations of the nonclassical symmetries method yield new nonlinear equations, which inherit the Die symmetry algebra of the given equation. Invariant solutions of these equations supply new solutions of the original equation. Furthermore, the equations yield both partial symmetries as given by Vorobev, and differential constraints as given by Vorobev and by Olver. Some examples are given. The importance of using ad hoc interactive REDUCE programs is underlined.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Oberkampf	W. L.	T. G. Trucano	AIAA 2000 - 2549: Validation Methodology in Computational Fluid Dynamics (invited)	Fluids 2000	American Institute of Aeronautics and Astronautics (AIAA)					19-22 June 2000	validation, CFD, uncertainty	A substantive paper that summarizes CFD validation state of the art.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Oberkampf	W. L.	T. G. Trucano	Validation Methodology in Computational Fluid Dynamics	Fluids 2000	AIAA					2000		Considered exemplary approach to V&V along with Roache.	Stevenson/864-656-5880/steve@cs.clemson.edu
Oberkampf	W.L.		Bibliography for Verification and Validation in Computational Simulation		Sandia National Laboratories		120		635-636	1998			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov

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Oberkampf	W.L.	Blottner, Frederick G.	Issues in Computational Fluid Dynamics Code Verification and Validation		AIAA		AIAA2000-2550			2000		Abstract: A broad range of mathematical modeling errors of fluid flow physics and numerical approximation errors is addressed in computational fluid dynamics (CFD). It is strongly believed that, if CFD is to have a major impact on the design of engineering hardware and flight systems, the level of confidence in complex simulations must substantially improve. To better understand the present limitations of CFD simulations, a wide variety of physical modeling, discretization, and solution errors are identified and discussed. Here, discretization and solution errors refer to all errors caused by conversion of the original partial differential, or integral, conservation equations representing the physical process to algebraic equations and their solution on a computer. The impact of boundary conditions on the solution of the partial differential equations and their discrete representation are discussed. Clear distinctions are made between the analytical mathematical models of fluid dynamics and the numerical models. Lax's Equivalence Theorem and its frailties in practical CF	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Oberkampf	W.L.	Blottner, F. G.; Aeschliman, D. P.	Methodology for Computational Fluid Dynamics Code Verification/Validation		AIAA		FED-213		25-30	1995			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Oberkampf	W.L.	Aeschliman, D. P.; Henfling, J. F.; Larson, D. E.	Surface Pressure Measurements for CFD Code Validation in Hypersonic Flow		AIAA					1998		Abstract: Extensive surface pressure measurements were obtained on a hypersonic vehicle configuration at Mach 8. All of the experimental results were obtained in the Sandia National Laboratories Mach 8 hypersonic wind tunnel for laminar boundary layer conditions. The basic vehicle configuration is a spherically blunted 10 degree half•angle cone with a slice parallel with the axis of the vehicle. The bluntness ratio of the geometry is 10% and the slice begins at 70% of the length of the vehicle. Surface pressure measurements were obtained for angles of attack from •10 to +18 degrees, for various roll angles, at 96 locations on the body surface. A new and innovative uncertainty analysis was devised to estimate the contributors to surface pressure measurement uncertainty. Quantitative estimates were computed for the uncertainty contributions due to the complete instrumentation system, nonuniformity of flow in the test section of the wind tunnel, and variations in the wind tunnel model. This extensive set of high•quality surface pressure measurements is recommended for use in the calibra	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov

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Oberkampf	W.L.	Aeschliman, D. P.; Henfling, J. F.; Larson, D. E.; Payne, J. L.	Surface Pressure Measurements on a Hypersonic Vehicle		AIAA		36	5	696-702	1998		Abstract: Extensive surface pressure measurements were obtained on a hypersonic vehicle configuration at Mach 8 for the purpose of computational fluid dynamic code validation. Experiments were conducted in the Sandia National Laboratories hypersonic wind tunnel. All measurements were made for laminar flow conditions at a Reynolds number (based on model length) of 1.81 x 10e6 and perfect gas conditions. The basic vehicle configuration is a spherically blunted, 10 deg. half-angle cone, with a slice parallel to the axis of the vehicle. Flaps of varying angle (10, 20, and 30 deg) could be attached to the aft portion of the slice. Surface pressure measurements at 96 locations on the body surface were obtained for angles of attack from -10 to +18 deg and for various roll angles. All three deflected flap angles produced separated flow on the sliced portion of the body in front of the flap. Because of the three-dimensional expansion over the slice, the separated flow on the slice and flap was highly three-dimensional. The results of the present	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Oberkampf	W.L.	Trucano, T. G.	Validation Methodology in Computational Fluid Dynamics		AIAA				345-351	1996			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Oberkampf	W.L.	Trucano, T. G.	Verification and Validation in Computational Fluid Dynamics	Progress in Aerospace Sciences			SAND2000-1444			2000			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Oberkampf	William L.	Christopher J. Roy and Mary A. McWherter-Payne	verification and validation for laminar hypersonic flowfields	AIAA Paper 2000-2550 (AIAA Accession number 33883)	Fluids 2000 Conference and Exhibit, Denver, CO					June 19-22, 2000	verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Oberkampf	William L.	Timothy G. Trucano	Verification and Validation in Computational Fluid Dynamics	Sandia Report SAND2002-0529	Sandia National Laboratories				111	37316	verification, validation, CFD, uncertainties	This paper presents an extensive review of the literature of V&V in CFD, discusses methods and procedures for assessing V&V, and develops a number of extensions to existing ideas. (From paper Abstract)	Dale K. Pace / 240-228-5650 /dale.pace@jhuapl.edu
Oberkampf	William L.	Sharon M. DeLand, Brian M. Rutherford, Kathleen V. Diegert, and Kenneth F. Alvin		Estimation of Total Uncertainty in Modeling and Simulation (Sandia Report SAND2000-0824)	Sandia national Laboratories Report SAND2000-0824 (Albuquerque, NM)					Qpril 2000	uncertainty, measurement, validation	Addresses the issues of uncertainty in M&S and in experimental data used as validation referents.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
O'Leary	Timothy J.	Michael Goul, Kathleen E. Moffitt, and A. Essam Radwan	Validating Expert Systems		IEEE Expert, Vol. 5, No. 3, pp. 51-58					1990			From Old DMSO VV&A Bibliography:
Orrell	David		Model Error in Weather Forecasting: Does Chaos Matter? Undated website paper -- http://www.beatrizl.freeserve.co.uk/AGUposter.htm (accessed August 2002).								uncertainty, error	Abstract: The accuracy of weather forecasts depends on two types of error: that due to uncertainty in the initial condition, and that due to inaccuracy in the particular model employed. The relative importance of each is a matter of some debate, primarily for lack of information about model error. A method of measuring model error is presented the context of nonlinear dynamical systems, and the technique demonstrated for the operational ECMWF models. Initial results show that model error contributes substantially in the short to medium range. Predictability is therefore limited, not primarily by sensitivity to initial conditions, but by error in the model. Implications for techniques for estimating forecast accuracy (i.e. ensemble forecasting) are discussed.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Ortiz	LCDR Vincent M.	Kimberly S. Wood	A Cooperative Accreditation Process in Support of Operational Testing	Proceedings of the 2000 International Test and Evaluation Association Modeling and Simulation Workshop	International Test and Evaluation Association					36861	verification, validation, accreditation process	This paper discusses a practical process that presents the required credibility to the end user in a disciplined manner and is sufficiently flexible to apply to most simulations.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com

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Ortiz	LCDR Vincent M.		An Operational Tester's Perspective on the Accreditation of Land Based Test Sites and Hardware-in-the-Loop Systems to Support Operational Testing	Virtual World	Program Executive Office for Theater Surface Combatants (PEO TSC), Systems Engineering for Modeling and Simulation, Code TD1MS			Vol. 2, No. 2	4	36705	operational testing, modeling and simulation, verification, validation, accreditation	Modeling and simulation (M&S) has played an increasingly important role in the operational testing of weapons systems. Commander, Operational Test and Evaluation Force (COMOPTEVFOR) has taken a proactive position on the intergration of M&S in operational testing. End user must take steps and procedures to gain confidence in and mitigate the risks associated with using all-hardware simulations and their output.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Pace	Dale K.		A Modest V&V Proposal	PHALANX	Military Operations Research Society (MORS)			Vol. 28/No. 4	16-17	35034	VV&A, cost	The article described a way for simulation community to collect VV&A cost information.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		A Paradigm for Modern Modeling and Simulaiton Verification, Validation, and Accreditation		Proceedings of the 1993 Summer Computer Simulation Conference (Boston, Massachusetts)					1993			From Old DMSO VV&A Bibliography:
Pace	Dale K.	S. M. Youngblood and P. C. Whitman	A Paradigm for Modern Modeling and Simulation Verification, Validation, and Accreditation	Proceedings of the Eighth Workshop on Standards for the Interoperability of Defense Simulations (DIS)	University of Central Florida Institute for Simulation and Training (UCF/IST) Distributed Interactive Simulation (DIS) Support			Vo. I	A-193 to A-200	34029	VV&A, distributed simulation, DIS	An early paradigm for VV&A of distributed simulation. Started process that led to IEEE Standard 1278.5 on DIS VV&A.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		A Paradigm for Modern Modeling and Simulation Verification, Validation, and Accreditation	Proceedings of 1993 Summer Computer Simulation Conference (SCSC)	Society for Computer Simulation (SCS)				36959	34151	VV&A, paradigm	Contains a paradigm that has been widely used in various VV&A publications.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		A Perspective on Simulation Validation	Proceedings of 1986 Summer Computer Simulation Conference (SCSC)	Society for Computer Simulation (SCS)				187-189	31594	validation, case history	Article describes process of simulation validation review involving multiple organizations from DoD, DOE, and industry.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Affordable and Effective Verification, Validation, and Accreditation of Computer Simulation	Proceedings of 1995 Summer Computer Simulation Conference (SCSC)	Society for Computer Simulation (SCS)				182-187	July 24-26, 1995	VV&A, cost, affordability	This article began to describe relationships between VV&A costs and the level of simulation credibility (validation).	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		An Aspect of VV&A Costs	PHALANX	Military Operations Research Society (MORS)			Vol. 30/No. 1	12-15	35490	validation, cost	The article focuses on how validation review costs varies with the level of credibility desired for a simulation.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		An Overview of Verification, Validation, and Accreditation within the Defense Community	Proceedings of 1994 Summer Computer Simulation Conference (SCSC)	Society for Computer Simulation (SCS)				645-648	July 18-20, 1994	DoD, VV&A	Describes VV&A policies and activities within the Defense community.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Capability of Explicit Conceptual Model on M&S Crediblity and Reuse	SURVIAC Workshop on Planning for Employment of Credible M&S in Defense Acquisition, Survivability, Lethality and Systems Effectiveness, March 4-7, 2002, Reno, NV						Jun-05	reuse, credibility		Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Conceptual Model Descriptions	Proceedings of 1999 Summer Computer Simulation Conference (SCSC)	Society for Computer Simulation (SCS)				on CD	July 12-14, 1999	conceptual model, validation	Continues development of ideas about describing simulation conceptual models.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Conceptual Model Descriptions	Proceedings of the Spring 1999 Simulation Interoperability Workshop (SIW)	Simulation Interoperability Standards Organization (SISO) Simulation Interoperability Workshop (SIW)				on CD	March 15-19, 1999	conceptual model, validation	Suggests how a simulation conceptual model should be developed and documented.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Conceptual Model Development for C4ISR Simulation	Proceedings of the 5th International Command and Control Research and Technology Symposium	US DoD/OASDC3I and Australian Department of Defense/DSTO				on CD	October 24-26, 2000	conceptual model, validation, C4ISR	This paper address conceptual model issues in C4ISR simulation.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Conceptual Model Role in Simulation Validation	Proceedings of the 6th U. S. National Congress on Computational Mechanics, August 1-3, 2001, Dearborn, MI						2001	Validation, conceptual model	Examines the role of a simulaiton conceptual Model in simulation validation.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Description and Estimation/Measurement of Simulation Fidelity	Proceedings of Caltech V&V of Computational Mechanics Codes Symposium	California Institute of Technology (Caltech)					December 9-11, 1998	fidelity, validation	Suggested a paradigm for describing simulation fidelity.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Development and Documentation of a Simulation Conceptual Model	Proceedings of the Fall 1999 Simulation Interoperability Workshop (SIW)	Simulation Interoperability Standards Organization (SISO) Simulation Interoperability Workshop (SIW)				on CD	September 12-17, 1999	conceptual model, validation	Continues development of ideas about describing simulation conceptual models.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu

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Pace	Dale K.		Dimensions and Attributes of Simulation Fidelity	Fall Simulation Interoperability Workshop Papers					55-64	18-Jun-05		Abstract: Simulation fidelity is tenebrous. Varied and sometimes conflicting ideas about simulation fidelity exist. Part of the current confusion stems from failure to distinguish between the dimensions and attributes of simulation fidelity; the dimensions of fidelity indicate the extent to which significant elements of the subject domain (mission space) are treated by the simulation and the fidelity attributes indicate the quality of treatment for significant factors addressed by the simulation. In addition, part of the confusion about simulation fidelity stems from mixing qualitative ideas with quantitative concepts. The paper strives to bring clarity to discussion of simulation fidelity by distinguishing the dimensions of fidelity from the attributes of fidelity and by keeping qualitative ideas about fidelity distinct from quantitative concepts. In so doing, it provides a foundation upon which more comprehensive frameworks for simulation fidelity can be developed. This approach does not permit a description of simulation fidelity by a single parameter, but requires a collection of parameters to	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Pace	Dale K.		Dimensions and Attributes of Simulation Fidelity	Proceedings of the Fall 1998 Simulation Interoperability Workshop (SIW)	Simulation Interoperability Standards Organization (SISO) Simulation Interoperability Workshop (SIW)				on CD	September 14-18, 1998	fidelity, validation, distributed simulation	Presents a paradigm for describing simulation fidelity.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Fidelity Consderations for RDE Distributed Simulations	Proceedings of the Fall 1997 Simulation Interoperability Workshop (SIW)	Simulation Interoperability Standards Organization (SISO) Simulation Interoperability Workshop (SIW)				249-259	September 8-12, 1997	validation, fidelity, distributed simulation	Started development of a fidelity paradigm for distributed simulations in research, development, and engineering applications.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Fidelity Considerations for RDE Distributed Simulation	Fall Simulation Interoperability Workshop Papers			AIAA Paper No. 97-2124			1997		Abstract: Research, development, and engineering (RDE) distributed simulations may be used to support decisions about system design and effectiveness. Accuracy and precision of experiment and test data related to the system, fidelity of simulation results, correctness of simulation input data, and dispersion of real system performance all must be addressed acceptably so that system decisions can account for performance risks appropriately. This can be a significant problem for systems with stringent performance requirements. These fidelity considerations are not peculiar to distributed simulation, but become more complicated in a distributed simulation environment (especially one which includes both live and constructive forces) because fidelity of simulation results is a consequence of the appropriateness of algorithms employed, implementation limitations imposed by hardware or personnel, and the impact of the distributed simulation environment on fidelity. This paper provides a construct for addressing these issues and identifies an approach to developing more robust methodologies to deal with t	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Pace	Dale K.		Ideas About Simulation Conceptual Model Development	Johns Hopkins APL Technical Digest	Johns hopkins University Applied Physics Laboratory			Vol. 21/No. 3	327-336	July-September 2000	conceptual model, validation	Discusses issues with simulation conceptual model development and documentation.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.	Robert. O. Lewis	Identificaton and Distribution of Selected VV&A Automation Tools Currently Being Used	Proceedings of a Workshop on Methods and Tools for Verification, Validation, and Accreditation	The Rand Corporation, Report PM-179-DMSO					October 5-6, 1993	VV&A tools, automation	Identified contemporary automation tools for VV&A.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Impact of Simulation Description on Conceptual Validation	Proceedings of the Fall 1998 Simulation Interoperability Workshop (SIW)	Simulation Interoperability Standards Organization (SISO) Simulation Interoperability Workshop (SIW)				on CD	September 14-18, 1998	validation, conceptual model, documentation	Describes how conceptual model documentation impacts simulation validation.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu

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Pace	Dale K.		Implications of Simulation Conceptual Model Development for Simulation Management and Uncertainty Assessment	Proceedings of the 1st Joint Arym-Navy-NASA-Air Force (JANNAF) Modeling and Simulation SubCommittee Meeting	Johns Hopkins University (JHU) Chemical Propulsion Information Agency (CPIA)						conceptual model, validation	Indicates the way that the simulation conceptual model interacts with simulation management and uncertainty assessment.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Issues Related to Quantifying Simulation Validation	Proceedings of the Fall 2001 Simulaiton Interoperability Workshop (SIW), Sept 10-14, 2001, Orlando, Fl (CD)						2001	validation, quantification, uncertainty		Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Issures Related to Quantifying Simulation Validaton	Proceedings of the Spring 2002 Simulaiton Interoperability Workshop (SIW), March 11-15, 2002, Orlando, Fl (CD)						2002	validation, quantification		Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Key Validation Issues for High Performance Computing	High Performance Computing '96: Proceedings of the 1996 Simulation MultiConference (SMC)	Society for Computer Simulation (SCS)				366-371	April 8-11, 1996	validation, visualization, high performance computing		Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Management Issues in Verifying and Validating Computer Models and Simulations	Proceedings of the American Society for Engineering Management 14th Annual Conference (ASEM)	American Society for Engineering Management (ASME)				182-185	October 24-26, 1993	VV&A, management	Identified management issues associated with simulation VV&A.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Model and Simulation Design-and-Development Procedures to Enhance Validation and Credibility	Proceedings of 1987 Summer Computer Simulation Conference (SCSC)	Society for Computer Simulation (SCS)				138-141	31959	validation, simulation development	An early discussion of the impact of validation of simulation development processes	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Model and Simulation Verification, Validation, and Accreditation	Proceedings of the PRC 95 Tech Seminar	PRC					21-22 March 1995	VV&A, tutorial	A VV&A tutorial for Defense community personnel	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Naval Modeling and Simulation Verification, Validation, and Accreditation	Proceedings of the 1993 Winter Simulation Conference (WSC)	Society for Computer Simulation (SCS)					December 12-15, 1993	Navy, VV&A	Describes Navy Interim Policy Guidance (IPG) for VV&A.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Naval VV&A Process	PHALANX	Military Operations Research Society (MORS)			Vol. 26/No. 3	27-29	34213	VV&A, Navy, paradigm, process	Describes Navy Interim Policy Guidance (IPG) for VV&A.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Perspectives on Approaches to Simulation Verification and Validation	Proceedings of the 2nd Joint Army-Navy-NASA-Air Force (JANNAF) Modeling and Simulation Subcommittee Meeting, April8-12, 2002, Destin, Fl						2002	verification and validation		Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Simulation Conceptual Model Development	Proceedings of the Spring 2000 Simulation Interoperability Workshop (SIW)	Simulation Interoperability Standards Organization (SISO) Simulation Interoperability Workshop (SIW)				on CD	March 26-31, 2000	conceptual model, validation	Suggests how a simulation conceptual model should be developed.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Simulation Conceptual Model Development Issues and Implications for Reuse of Simulation Components	Proceedings of the Fall 2000 Simulation Interoperability Workshop (SIW)	Simulation Interoperability Standards Organization (SISO) Simulation Interoperability Workshop (SIW)				on CD	September 17-22, 2000	conceptual model, validation, reuse	This article begins consideration of conceptual model development and documentation processes impact on simulation reuse.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Simulation Conceptual Model Issues: Development Methods (Part 1), Interaction with Simulation Requirements (Part 2), and Simulation Development Costs and V&V Costs (Part 3)	Proceedings of the 2000 Summer Computer Simulation Conference (SCSC)	Society for Computer Simulation (SCS)				488-499	July 16-20, 2000	conceptual model, validation	One of the more comprehensive discussions of simulation conceptual model issues.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Simulation Verification and Validation (V&V) in Engineering Education	Proceedings of the International Conference on Simulation and Multimedia in Engineering Education (ICSEE 2000) at Western MultiConference (WMC)	Society for Computer Simulation (SCS)			Vol. 32/No. 1	97-102	January 23-27, 2000	V&V, engineering education	Suggests what should be included in basic V&V instruction in engineering curricula and where such might be included.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		SIMVAL 99	Proceedings of 1999 Summer Computer Simulation Conference (SCSC)	Society for Computer Simulation (SCS)				on CD	July 12-14, 1999	SIMVAL, validation	Describes the MORS 1999 simulation validation (SIMVAL) workshop.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.	Priscilla Glasow	SIMVAL 99 Final Report		Military Operations Research Society (MORS)					36245	simulation, validation, SIMVAL	The report of the MORS 1999 simulation validation (SIMVAL) workshop.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu

Lead Author Last Name	Lead Author First Name & MI	Other Authors	Item Title	Journal/Book Title	Publisher	ISBN/ISSN	Chapter or Volume	Edition/Issue (volume may be in column to left)	Pages	Publication Date	Keywords	Annotation (2-3 sentences about item significance)	Item submitted by (name/phone/email)
Pace	Dale K.		Synopsis of Fidelity Ideas and Issues	Spring Simulation Interoperatibility Workshop Papers			31	11	2733-2742	1995		Abstract: This paper provides a synopsis of simulation fidelity ideas and issues, especially as they pertain to distributed simulation. The goal of this paper is to provide a solid information foundation from past endeavors to support continuing discussion of the important topic of simulation fidelity. The references of this appear identify not only previously published fidelity appears, reports, documents, and websites from various sources, including past Simulation Interoperability (SIW) and Distributed Interactive Simulation (DIS) workshops, but also identify the dozen fidelity related papers submitted for the March 1998 SIW. A brief comment about the January 1998 meeting of the Fidelity Subgroup of the SIW Research, Development, and Engineering (RDE) User Community Forum is included at the end of the paper. This paper should be a valuable resource for those who wish to take advantage of past thinking on fidelity issues.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Pace	Dale K.		Synopsis of Fidelity Ideas and Issues	Proceedings of the Spring 1998 Simulation Interoperability Workshop (SIW)	Simulation Interoperability Standards Organization (SISO) Simulation Interoperability Workshop (SIW)			Vo. 1	420-429	March 9-13, 1997	fidelity, validation, distributed simulation	Provides an overview of perspective on simulation fidelity within the Defense distributed simulation community.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Technical and Management Factors That Can Enhance Simulation Development and Effective Use		Proceedings of the 1991 Summer Simulation Conference, pp. 3-8					1991			From Old DMSO VV&A Bibliography:
Pace	Dale K.		Use of Subject Matter Experts (SMEs) in Simulation Evaluation	Proceedings of the Fall 1999 Simulation Interoperability Workshop (SIW)	Simulation Interoperability Standards Organization (SISO) Simulation Interoperability Workshop (SIW)				on CD	September 12-17, 1999	SME, validation	Presents guidance for using SMEs in VV&A.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		V&V Technology	Proceedings of 1999 Summer Computer Simulation Conference (SCSC)	Society for Computer Simulation (SCS)				on CD	July 12-14, 1999	V&V, technology, validation, verification	Reviews contemporary state of V&V technology and its likely evolution.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Validation Elaboration	Proceedings of the 2002 Summer Computer Simulation Conference, July 15-17, 2002, San Diego, CA, CD	Society for Computer Simulation International					2002	validation		Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Validation for Management Decision Support Systems		Proceedings of the 1990 Annual Meeting of the American Society for Engineering Management, pp. 137-139					1990			From Old DMSO VV&A Bibliography:
Pace	Dale K.		Validation for Management Decision Support Systems	Proceedings of 1990 Annual Meeting of American Society for Engineering Management (ASEM)	American Society for Engineering Management (ASME)				137-139	October 14-16, 1990	validation, decision aids, management	Addresses validation associated with decision aids, especially decision aids for managers.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.	and Dennis P. Shea	Validation of Analysis Which Employs Multiple Computer Simulations		Proceedings of the 1992 Summer Computer Simulation Conference in Reno, Nevada, pp. 144-149					Jun-05	Validation		From Old DMSO VV&A Bibliography:
Pace	Dale K.	D. P. Shea	Validation of Analysis Which Employs Multiple Computer Simulations	Proceedings of 1992 Summer Computer Simulation Conference (SCSC)	Society for Computer Simulation (SCS)				144-149	July 27-30, 1992	validation, multiple simulations, analysis	Addresses validation issues that arise when more than one simulation is used in an analysis. Contains early case history based information about resources required for validation.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Verification and Validation for Wargame 2000	Proceedings of 1998 Summer Computer Simulation Conference (SCSC)	Society for Computer Simulation (SCS)				639-644	July 19-22, 1998	verification, validation, Wargame 2000	Describes verification and validation activities for Wargame 2000.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Verification, Validation, and Accreditation (Chapter 11)	Applied Modeling and Simulation: An Integrated Approach to Development and Operation (Eds: D. J. Cloud and L. B. Raines)	McGraw-Hill				369-410	20-Jun-05	VV&A, methods, paradigms, management	VV&A section of modeling and simulation textbook.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu

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Pace	Dale K.		Verification, Validation, and Accreditation (VV&A) Working Group	Summary Report: 9th Workshop on Standards for the Interoperability of Defense Simulations (DIS)	University of Central Florida Institute for Simulation and Training (UCF/IST) Distributed Interactive Simulation (DIS) Support			Vol. I	69-71	September 13-17, 1993	VV&A, distributed simulation, DIS	Reports early progress and plans of DIS VV&A Working Group.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.	S. M. Youngblood and P.C. Whitman	Verification, Validation, and Accreditation (VVA) for Distributed Simulation		Proceedings of the Eighth Workshop on Standards for the Interoperability of Defense Simulations					15-Jun-05			From Old DMSO VV&A Bibliography:
Pace	Dale K.		Verification, Validation, and Accreditation Issues for Computer Simulations Which Employ Artificial Intelligence Techniques	Proceedings of the Fall 1997 Simulation Interoperability Workshop (SIW)	Simulation Interoperability Standards Organization (SISO) Simulation Interoperability Workshop (SIW)				249-259	September 8-12, 1996	VV&A, AI	Addressed validation issues for simulations using AI.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dale K.		Verification, Validation, and Accreditation Issues for Models and Simulations Used in the Acquisition Process	Proceedings of the ASNE 1996 Modeling, Simulation, and Virtual Prototyping Conference	American Society for Naval Engineers (ASNE)				289-309	June 24-26, 1996	VV&A, acquisition, design	Identified VV&A issues associated with use of multiple simulations for different parts of Defense acquisition. Same issues apply to simulation based acquisition (SBA).	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pace	Dr. D. K.	and S. M. Youngblood	Proposed Verification, Validation, and Accrediation Processes for Navy Managed Models and Simulation		Johns Hopkins University/Applied Physics Laboratory Internal Memorandum NWA-92-002					1993			From Old DMSO VV&A Bibliography: Draft Version of Proposed Navy VVA Processes
Pace	Dr. D. K.	and S. M. Youngblood	Proposed Verification, Validation, and Accrediation Processes for Navy Managed Models and Simulation		Space and Naval Warfare Systems Command (SPAWAR) 31 Distributed Document					15-Jun-05			From Old DMSO VV&A Bibliography: Revision of entry #242
Pack	David L.	Bradford S. Canova, Peter H. Christensen, Michael D. Lee, Bruce R. Tripp, Michael H. Pack,	Simulation To Support Operational Testing: A Practical Application	Proceedings of the 1999 Winter Simulation Conference	Society for Computer Simulation International					36495	verification, validation, Predator SRAW	This paper describes a combined effort between the Marine Corps Systems Command (MARCORSYSCOM), the Marine Corps Operational Test and Evaluation Activity (MCOTEA) and the MITRE Corporation to exploit M&S to support Operational Test (OT) of the Predator Short Range Assault Weapon (SRAW).	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Pack	Michael H.	Bradford S. Canova, Peter H. Christensen, Michael D. Lee, Bruce R. Tripp, David L. Pack	Simulation To Support Operational Testing: A Practical Application	Proceedings of the 1999 Winter Simulation Conference	Society for Computer Simulation International					36495	verification, validation, Predator SRAW	This paper describes a combined effort between the Marine Corps Systems Command (MARCORSYSCOM), the Marine Corps Operational Test and Evaluation Activity (MCOTEA) and the MITRE Corporation to exploit M&S to support Operational Test (OT) of the Predator Short Range Assault Weapon (SRAW).	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Padulo	Louis	Arbib, M.A.	System Theory		Philadelphia: Saunders					1974			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Paez	T. L.	A. Urbina	Validation of Mathematical Models of Complex Structural Dynamic Systems	Proceedings of the Ninth International Congress on Sound and Vibration, Orlando, FL						2002	validation		
Paez	T.	A. Urbina	Validation of Structural Dynamics Models Via Hypothesis Testing	Society of Experimental Mechanics Annual Conference, Portland, OR						2001	validation		
Paez	T.	P. Barney, N. Hunter, C. Ferregut, and L. Perez	Statistical Validation of Physical System Models	Proccedings of the 67th Shock and Vibration Symposium, SVIC, Monterey, CA 1996						1996			Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Page	Ernest H.	David M. Nicol, Osman Balci, Richard M. Fujimoto, Paul A. Fishwick, Pierre L'Ecuyer, and Rogers Smith	Panel: Strategic Directions in Simulation Research	Proceedings of the 1999 Winter Simulation Conference (Phoenix, AZ, Dec. 5-8, 1999)	IEEE, Piscataway, NJ				1509-1520	1999			
Page	Ernest, P.	Canova, B.S. Tufarolo, J.A.	A Case Study of Verification, Validation and Accreditation for Advanced Distributed Simulation.	ACM Transactions on Modeling and Computer Simulation			1997. 7(7)		p. 393-424	1997			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Palmer	T. N.		Predicting Uncertainty in Forecasts of Weather and Climate	Reports on Progress in Physics					71-116	2000		Widely circulated in the ASCI community	Stevenson/864-656-5880/steve@cs.clemson.edu
Palmore	Julian		Analysis and Verification and Validation of Complex Models		Proceedings of the 1992 Summer Computer Simulation Conference in Reno, Nevada, pp. 139-143					1992			From Old DMSO VV&A Bibliography: Focused upon minute computational details

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Palmore	Julian		Verification and Validation of Computer Simulations of Deterministic Dynamical Systems		Proceedings of the 1991 Summer Computer Simulation Conference in Baltimore, MD, pp. 26-31					1991			From Old DMSO VV&A Bibliography: Focused upon minute computational details
Palmore	Julian		Verification, Validation, and Visualization of Dynamical Processes in a Parallel Computing Environment		Proceedings of the 1993 High Performance Computing Symposium, Grand Challenges in Computer Simulation, the Society for Computer Simulation. pp. 197-202					Jun-05			From Old DMSO VV&A Bibliography:
Palmore	Julian		Verifying Discrete Event Simulations Containing Embedded Dynamical Systems		Proceedings of the 1993 High Performance Computing Symposium, Grand Challenges in Computer Simulation, the Society for Computer Simulation. pp. 197-202					Jun-05			From Old DMSO VV&A Bibliography:
Paris	W.	G. Nielsen, R. Sacco, E. White, and E. Reich	Accreditation Review: Evaluation of Air Defense Effectiveness (EVADE) Aircraft Survivability/Attrition Model		U. S. Army Materiel Systems Analysis Activity (AMSAA) Briefing					1992			From Old DMSO VV&A Bibliography:
Paulo	Eugene P.	Scott D. Simpkins, Lyn R. Whitaker	Case Study In Modeling And Simulation Validation Methodology	Proceedings of the 2001 Winter Simulation Conference	Society for Computer Simulation International					Dec-01	validation, Wargame 2000	The paper focuses on practical validation from the analyst's perspective in the form of a case study. The platform used is the theater missile defense (TMD) aspects of Extended Air Defense Simulation (EADSIM) and a new simulation called Wargame 2000.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Pearl	Judea			Causality: Models, Reasoning, and Inference	Cambridge University Press					Jun-05		Compendium of techniques. Destined to be a classic in reasoning with uncertainty	Stevenson/864-656-5880/steve@cs.clemson.edu
Pearman	Gerald M.	Dixon D. Dykman	Statistical Validation of a Re-Engineered Legacy Simulation	Proceedings of SimTec T 2000, 28 February to 2 March 2000, Sydney, Australia	Simulation Industry Association of Australia Limited A.C.N.					Mar-00	statistical validation	The statistical validation process described in this paper supports validation efforts of re-hosted simulations.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Pecheur	Charles	James Caldwell, Reid Simmons, & Willem Visser	RIACS Workshop (Asilomar Conference Center, Pacific Grove, CA, 5-7 Dec 2000) on the Verification and Validation of Autonomous and Adaptive Systems (Version 2.2 dated 2/23/2001) -- http://ase.arc.nasa.gov/vv2000/asilomar-report.html (accessed August 2002)							Feb-01	V&V, autonomous systems, adaptive systems, AI	The first day of the workshop had five speakers present different real cases of autonomous or adaptive (A&A) systems and discuss the verification and validation (V&V) issues that those applications entail. The second day was devoted to open discussions in small breakout groups, aimed at drafting "research roadmaps for addressing critical issues in V&V of A&A systems". A list of issues had been assembled by the organizers and distributed to seed the discussions. Following the workshop, the organizers took duty of summarizing the discussions, in cooperation with all attendees. This report is the outcome of that process. Its authors were the organizers of the workshop and the moderators of the discussion groups.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pecheur	Charles	Reid Simmons	From Livingstone to SMV: Formal Verification for Autonomous SpacecraftsIn: Lecture Notes in Computer Science, vol. 1871, Springer Verlag.	Formal Approaches to Agent-Based Systems.First International Workshop, FAABS 2000	Springer	3-540-42716-3	1871	Lecture Notes in Computer Science	103-113	36617	model checking, translation, model-based diagnosis, Livingstone, SMV	Describes the use of symbolic model checking to analyze models used in model-based diagnosis, and a tool to translate models from the Livingstone diagnosis system to the SMV model checker.	Charles Pecheur/+1-650-604-3588/pecheur@email.arc.nasa.gov
Pecheur	Charles	Reid Simmons and Willem Visser	Issues in Verification and Validation of Autonomous and Adaptive Systems	http://ase.arc.nasa.gov/vv2000/asilomar-questions.html; accessed 7 April 2002 -- This document is food for thought in preparation of the RIACS Workshop On the Verification and Validation of Autonomous and Adaptive Systems (Asilomar, CA, 5-7 Dec 2000)						36865		This document is food for thought in preparation of the RIACS Workshop On the Verification and Validation of Autonomous and Adaptive Systems (Asilomar, CA, 5-7 Dec 2000)	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu; key words & annotation from paper abstract.

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Perez	L.	C. Ferregut, C. Carrasco, T. Paez, P. Barney, and N. Hunter	Statistical Validation of Plate Finite Element Model for Damage Detection	Proceedings of the SPIE Conference on Smart Structures	SPIE					1997			Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Pilch	M.	Trucano, T. G.; Moya, J. L.; Froehlich, G. K.; Hodges, A. L.; Peercy, D. E.	Guidelines for Sandia ASCI Verification and Validation Plans - Content and Format: Version 2		Sandia National Laboratories		AIAA 98-2639		7	1998			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Plant	Robert T.		Tools for the Validation & Verification of Knowledge-Based Systems: 1985-1995 References	http://www.csd.abdn.ac.uk/~apreece/Research/vvtools.html; accessed 7 April 2002						1995?	KBS V&V	A bibliography of knowledge-based system V&V 1985-1995.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Popov	Peter	Lorenzo Strigini and Bev Littlewood	Choosing Between Fault-Tolerance and Increased V&V for Improving Reliability	http://www.csr.city.ac.uk/csr_city/projects/diversity/Papers/Reliab_vs_diversity/PDPTA2000.pdf; accessed 7 Apr 02 -- (Presented at PDPTA'2000, 26 - 29 June, 2000, Las Vegas, USA. This version corresponds to Version 1.0, 31 May 2000, of the DISPO Technical Report of the same title, PP_DD_TR-06_v1.0)						36677	Software diversity, Fault-tolerance, Software Reliability Growth, Failure Dependence, multiple-version software	Fault tolerant systems based on the use of software design diversity may be able to achieve high levels of reliability more cost-effectively than other approaches, such as heroic debugging. Earlier experiments have shown that multi-version software systems are more reliable than the individual versions. However, it is also clear that the reliability benefits are much worse than would be suggested by naive assumptions of failure independence between the versions. To decide whether to use design diversity or other means for achieving the desired reliability a developer would need to know how they compare from the viewpoint of cost-effectiveness. Empirical data are insufficient for deciding this question, and expert opinions differ. We refute a recently published argument in favour of diversity and in the process show some general factors deciding whether process improvement, or debugging of the versions in a multiple-version system, will increase or decrease the statistical correlation between failures of the versions. The conclusion is that there is as yet no evidence	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu; key words & annotation from paper abstract.
Popper	Karl R.			Logic of Discovery	New York: Basic Books					1935(1959)		Important text in philosophy of science.	Stevenson/864-656-5880/steve@cs.clemson.edu
Porter	J. L.		Introduction to CFD Code Validation/Calibration Workshop No. 1		Sverdrup Technology, Inc., Eglin AFB for the Computational Fluid Dynamics Code Validation/Calibration JANNAF Airbreathing Propulsion Subcommittee Workshop - High-Speed Inlet Forebody Interactions (The Johns Hopkins University) , NTIS, p. 1					1991	validation		From Old DMSO VV&A Bibliography: Outlines a code validation process and its pitfalls

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Porter	John L.		A Summary/Overview of Selected Computational Fluid Dynamics (CFD) Code Validation/Calibration Activities		AIAA		ASME 2000-FED-11233			2000		Abstract: The results of a series of workshops sponsored by the Joint Army/Navy/NASA/AirForce (JANNAF) Airbreathing Propulsion Committee are reviewed. The results address the need for, and the process needed for establishing, archival benchmark experiments; the definition of the validation process; the process of establishing CFD code validation/verification test programs; and information management for the CFD experimental archival data. The results are presented from the points of view of experimentalists, code developers, and generalists/managers. The issues associated with the validation process are also discussed and summarized. The coordination of the workshop activities with other organizations: AGARD, SAE, and the AIAA, is also described. Developments regarding publications standards being addressed by the AIAA CFD Committee on Standards (CFD/COS) are described. Key steps required to help CFD play a more viable role in engineering design and performance processes are discussed in the paper's summary.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Prabhu	Dinesh K	Michael J. Wright, Joseph G. Marvin, James L. Brown, and Ethiraj Venkatapathy	X-33 aerothermal design environment predictions - verification and validation	AIAA Paper 2000-2686 (AIAA Accession number 33735)	AIAA Thermophysics Conference, 34th, Denver, CO					June 19-22, 2000	verification, validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Preece,	Alun	Pedro Meseguer and Bob O'Keefe	Verification, Validation & Testing of Knowledge-Based Systems: An Annotated Selective Bibliography	http://www.csd.abdn.ac.uk/~apreece/Research/vvbiblio.html; accessed 7 Apr 02 -- last updated in 1995.						1995	KBS VV&T	Annotated bibliography of verification, validation, and testing of knowledge-based systems.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Rainis	Dr. Al		Joint Aeronautical Commanders Group Initiative on Accreditation Support		Briefing by Dr. Al Rainis (Office of the Under Secretary of Defense (Acquisitions)/Tactical Systems)					1993			From Old DMSO VV&A Bibliography: Briefing
Rakitin	Steven R.		Software Verification and Validation	Artech House			AIAA-98-2875		7	Jun-05			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Rakitin	Steven, R.			Software Verification and Validation for Practitioners and Managers, 2nd edition	Artech House	1-58053-296-9		second edition	387	2001	software quality, software verification, software validation, software reliability growth, predictable software development	This book provide a concise and practical introduction to the basis principles of software verification and validation. The material is intended to help practitioners improve their skills and to help managers understand their role in improving the effecti	Steven R. Rakitin, phone 508.529.4282, e-mail: info@swqual.com
Ratel	C.	N. Halbwachs and P. Raymond	Programming and Verifying Critical Systems by means of the Synchronous Data-Flow Programming Language LUSTRE		ACM-SIGSOFT'91 Conference on Software for Critical Systems					1991	Verification		From Old DMSO VV&A Bibliography:

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Reading	Richard	Ronald Sawyer	Simulation-Based Testing of Ship Self Defense	Proceedings of the 2002 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Organziation					Mar. 10-15, 2002	Test and Evaluation, Navy Ship Self Defense, Combat Systems, validation	The Navy faces complex combat system development and interoperability issues for surface combatants, amphibious ships, and aircraft carriers. Of particular interest is total ship combat system assessment for ship self defense, given by the Probability of Raid Annihilation (PRA) Measure of Effectiveness (MOE). According to the DoD's Director of Test & Evaluation (DOT&E), assessment of the PRA MOE hinges on effective use of modeling and simulation. A Navy PRA assessment process strategy has been established, with distributed, interoperable simulations in a central role. Each new ship class will develop a 'PRA federation' that is supported by validation efforts using live test events.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Reed	Helen L.	Haynes, Tim S.; Saric, William S.	Computational Fluid Dynamics Validation Issues in Transition Modeling	AIAA Journal			46	4	524-545	1995		Abstract: Laminar•turbulent transition is highly initial- and operating-condition dependent. Finding careful, archival experiments for comparison is the main validation issue for computational fluid dynamics (CFD) modeling. The CFD formulations validated to date demonstrate that if the environment and operating conditions can be modeled and input correctly, the computations (nonlinear parabolized stability equations and direct numerical simulations) agree quantitatively with the experiments. Future challenges for validation include successful CFD simulations of other available complete databases, CFD leadership in the identification and modeling of the effects of freestream disturbances, CFD leadership in the determination of relevant validation experiments for supersonic and hypersonic flows, careful validation experiments and CFD solutions for complex three-dimensional geometries, and simulations and validations for the high Reynolds numbers of flight.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Reifer	Donald J.		Estimating Web Development Costs: There are Differences	Crosstalk, June 2002	Journal of Defense Software Engineering		pp 13-17	Vol 15 No. 6	5	37408	Costs, Software Development, Web	Introduces new cost estimation model, albeit for Web development efforts, and a new metric "web objects" for size estimation	Dave Hall; 760-446-4624;daveh@survice.com
Reifer	Donald J.		Estimating Web Development Costs: There are Differences	Crosstalk, June 2002	Journal of Defense Software Engineering		pp 13-17	Vol 15 No. 6	5	37408	Costs, Software Development, Web	Introduces new cost estimation model, albeit for Web development efforts, and a new metric "web objects" for size estimation	Dave Hall; 760-446-4624;daveh@survice.com
Reynolds	Paul, F.	Srinivasan, S. Natrajan, A.	Consistency Maintenance in Multiresolution Simulators	ACM Trans on Modeling and Simulation			1997.July			Jun-05			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Ricci	Vittorio	Lynee D. Murray	Measurement Error And Verification, Validation, & Accreditation	Proceedings of the 2002 Fall Simulation Interoperability Workshop	Simulation Interoperability Standards Organziation					Sept. 8-13, 2002	Measurement error, risk, statistics, time sampling	This paper illustrates the process of evaluating measurement error in Low to Moderate Risk computer simulations used in training Unmanned Surface Vehicle operations.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Richbourg	Robert F.	Robert J. Graebener, Tim Stone, & Keith Green	Verification And Validation (V & V) Of Federation Synthetic Natural Environments	Proceedings of the Interservice/Industry Training, Simulation and Education Conference	National Training Systems Association (NTSA)					37196	verification, validation, synethic environment	This paper addresses V&V of federated synthetic environments.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Ridgeway	Debra		An Overview on the Update of DA PAM 5-11, Verification, Validation, and Accreditation of Army Models and Simulations	Proceedings of the 1999 Society For Computer Simulation Conference	Society for Computer Simulation International					36342	DA PAM 5-11, verification, validation, accreditation, models, simulations	This paper provides an overview of the updated VV&A guidelines for the Army, DA PAM 5-11.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Ridgeway	Debra		Verification, Validation And Accreditation, The Most Misunderstood Friend Of Models And Simulations	Proceedings of the 2000 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Orgranization					36770	verification, validation, accreditation	Verification, validation and accreditation is "a friend to M&S."	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Ritchie	Adelia E. (ed.)		Simulation Validation Workshop Proceedings (SIMVAL II)	Simulation Validation Workshop Proceedings (SIMVAL II)	Military Operations Research Society (MORS)					33695	validation, SIMVAL	Report of the second MORS workshop on simulation validation (SIMVAL II).	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu

Lead Author Last Name	Lead Author First Name & MI	Other Authors	Item Title	Journal/Book Title	Publisher	ISBN/ISSN	Chapter or Volume	Edition/Issue (volume may be in column to left)	Pages	Publication Date	Keywords	Annotation (2-3 sentences about item significance)	Item submitted by (name/phone/email)
Rizzi	Arthur	Vos, Jan	Toward Establishing Credibility in Computational Fluid Dynamics Simulations	AIAA Journal			AIAA 98-2640		12	1998		Abstract: Essential steps toward establishing credibility in computational fluid dynamics (CFD) simulations are outlined, and a vision for the process of systematic collaborative validation that is open to public scrutiny via the Internet is suggested. It begins with an exposition of the elements of CFD simulations and reviews protocols useful for establishing credibility. The various sources of uncertainty in CFD, which include the skills of the user, are presented. Lessons learned from collective verification and validation exercises done in the past are surveyed and lead to our suggestion for a systematic validation process that requires the creation and use of a detailed flow taxonomy and an electronic database to carry out the validation process. This database archives but also gives easy access to trustworthy data and allows full public discussion and scrutiny of the information, comparisons, and hypotheses so that judgments and conclusions about the validation may be accepted or rejected by the scientific community at large. The taxonomy also is the basis on which the c	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Roache	P. J.		Code Verification by the Method of Manufactured Solutions	Journal of Fluids Engineering			114	1	4-10	2002	verification, manufactured solutions		
Roache	P. J.		Quantification of Uncertainty in Computational Fluid Dynamics	Annual Reivew of Fluid Dynamics (J. L. Lumley and M. Van Dyke, eds.)	Annual Reviews, Inc., Pal Alto, CA				126-160	19-Jun-05	uncertainty		
Roache	P. J.		Verification of Codes and Calculations	AIAA Journal			36	5	696-702	1998	verification		
Roache	P. J.			Verification and Validation in Computational Science and Engineering	Albuquerque, NM: Hermosa Publishers					Jun-05		First true V&V text	Stevenson/864-656-5880/steve@cs.clemson.edu
Roache	P.J.		Discussion: Uncertainties and CFD Code Validation	Journal of Fluids Engineering			AIAA-95-0528			1995			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Roache	P.J.		Verification and Validation in Computational Science and Engineering		Hermosa Publishers		SAND98-2776			1998			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Roache	P.J.		Verification of Codes and Calculations	AIAA Journal			SAND2001-1339			2001		Abstract: Background discussion, definitions, and descriptions are given for some terms related to confidence building between verification of codes vs verification of individual calculations. Also discussed are numerical errors vs conceptual modeling errors; iterative convergence vs grid convergence (or residual accuracy vs discretization accuracy); confirmation, calibration, tuning, and certification; error taxonomies; and customer illusions vs customer care. Emphasis is given to rigorous code verification via systematic grid convergence using the method of manufactured solutions, and a simple method for uniform reporting of grid convergence studies using the Grid Convergence Index (GCI). Also discussed are surrogate single•grid error indicators.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Roache	Patrick J.		Verification and Validation in Computational Science and Engineering	Verification and Validation in Computational Science and Engineering		0-913478-08-3				1998	verification, validation, CFD, computational mechanics	The "bible" for V&V in CFD and computational mechanics.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Robinson	S		Simulation Verification, Validation, and Confidence: A Tutorial	Transactions of the Society for Computer Simulation International			16		63-69	1999	verification, validation		
Rook	Paul (ed.)		Software Reliability Handbook (Centre for Software Reliability, City University, London, UK)		Elsevier Science Publishers, Ltd ISBN 1-85166-400-9, pp.12, 22,113,163,171-189, 367 435					1990	life cycle, validation, verification, testing		From Old DMSO VV&A Bibliography: Describes a software development life cycle, some cost information

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Roscoe	M. F.	G. M. VanderVliet and C. H. Wilkinson	Verification. validation, and accreditation of flight simulator: The JSHIP experience	AIAA Paper 2001-4061 (AIAA Accession number 37379)	AIAA Modeling and Simulation Technologies Conference and Exhibit, Montreal, Canada					Aug. 6-9, 2001	verification, validation, accreditation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Rosenberg	Linda		Verification and Validation Implementation at NASA	CrossTalk: The Journal of Defense Software Engineering	Available on-line at: www.stsc.hill.af.mil/Crosstalk/crosstalk.html		14	5	12-15	37012	verification, validation, V&V, IV&V, NASA	Describes NASA's new IV&V implementation on all software development	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Roy	C.J.	McWherter-Payne, M. A.; Oberkampf, W. L.	Verification and Validation for Laminar Hypersonic Flowfields		AIAA		AIAA 96-2028		12	1996			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Roy	Christopher J.	Mary A. McWherter-Payne and William L. Oberkampf	verification and validation for laminar hypersonic flowfields	AIAA Paper 2000-2550 (AIAA Accession number 33883)	Fluids 2000 Conference and Exhibit, Denver, CO					June 19-22, 2000	verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Sacks	Jerome	Nagui M. Rouphail, B. Brian Park, & Piyushimita (Vonu) Thakuriah	Statistically-Based Validation of Computer Simulation Models in Traffic Operations and Management	Paper submitted to the Journal Transportation and Statistics, December 2000, available at http://www.niss.org/technicalreports/tr112.pdf (accessed August 2002)					35 pp	Dec-00	transportation simulation, statistical validation	The process of model validation is crucial for the use of computer simulation models in transportation policy, planning and operations. The obstacles that must be overcome and the issues that must be treated in performing a validation are laid out here. We describe a general process that emphasizes five essential ingredients for validation: context, data, uncertainty, feedback, and prediction. We use a test-bed to generate specific (and general) questions and to give concrete form to answers and the methods used in providing them.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Salaani	M. Kamel	Gary J. Heydinger	Model Validation of The 1997 Jeep Cherokee For the National Advanced Driving Simulator	Society of Automotice Engineers (SAE) Paper No. 2000-01-0700, March 2000. http://www-nrd.nhtsa.dot.gov/vrtc/ca/capubs\jeep_valid.pdf (accessed August 2002).	Society of Automotice Engineers (SAE)					2000	auto model validation	This paper presents an evaluation of a complete vehicle dynamics model for a 1997 Jeep Cherokee to be used for the National Advanced Driving Simulator. Vehicle handling and powertrain dynamics are evaluated and simulation results are compared with experimental field-testing. NADSdyna, the National Advanced Driving Simulator vehicle dynamics software, is used. The Jeep evaluation covers vehicle directional dynamics that include steady state, transient and frequency response, and vehicle longitudinal dynamics that include acceleration and braking.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Salari	K.	Knupp, P.	Code Verification by the Method of Manufactured Solutions		Sandia National Labs		515		427-432	1998			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Salari	K.	Blaine, R. L.; Economy, K.; Roache, P. J.	Grid Resolution Studies of Radionuclide Transport in Fractured Porous Media		American Society of Mechanical Engineers		AIAA 98-2874		18	1998			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Salari	Kambiz	Patrick Knupp	Code Verification by the Method of Manufactured Solutions	Code Verification by the Method of Manufactured Solutions	Sandia National Laboratories Report SAND2000-1444					36678	verification, CFD, manufactured solutions	The Method of Manufactured Solutions (MMS) can be applied to a number of engineering codes which numerically solve partial differential equations. Has CFD examples.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Sargent	Robert G.		Some Subjective Validation Methods Using Graphical Displays of Data		Winter Simulation Conference		AIAA-98-2486		22	1998		Abstract: Subjective methods for operational validity are presented that use graphical displays of histograms, box plots, and behavior graphs. These methods allow the data to be correlated, have any statistical distribution, and be limited in the number of observations. Model data are used for the reference distribution (instead of a theoretical distribution such as the t or F) and for reference to compare the system data against. These methods are very general and can be used in validating different types of models.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov

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Sargent	Robert G.		Validation And Verification Of Simulation Models	1999 Winter Simulation Conference	Society for Computer Simulation (SCS)					1999	validation methods	Abstract: This paper discusses validation and verification of simulation models. The different approaches to deciding model validity are presented; how model validation and verification relate to the model development process are discussed; various validation techniques are defined; conceptual model validity, model verification, operational validity, and data validity are described; ways to document results are given; and a recommended procedure is presented.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Sargent	Robert G.		Verifying and Validating Simulation Models		Winter Simulation Conference		AIAA-96-0892			1996		Abstract: This paper discusses verification and validation of simulation models. The different approaches to deciding model validity are presented; how model verification and validation relate to the model development process are discussed; various validation techniques are defined; conceptual model validity, model verification, operational validity, and data validity are described; ways to document results are given; and a recommended procedure is presented.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Sargent	Robert, G.		Verification and Validation of Simulation Models	Winter Simulation Conference						1994			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Sarjoughian	Hessam, S.	Zeigler, B.P.	DEVS and HLA: Complementary Paradigms for Modeling and Simulation?	Transactions of the Society for Modeling and Simulation International.			2000. 17(4)		p. 187-197	2000			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Sarjoughian	Hessam. S.	Cellier, F.E.	Discrete Event Modeling and Simulation Technologies: A Tapestry of Systems and AI-Based Theories and Methodologies.		Springer Verlag.					2001			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Sawyer	Ronald	Richard Reading	Simulation-Based Testing of Ship Self Defense	Proceedings of the 2002 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Organziation					Mar. 10-15, 2002	Test and Evaluation, Navy Ship Self Defense, Combat Systems, validation	The Navy faces complex combat system development and interoperability issues for surface combatants, amphibious ships, and aircraft carriers. Of particular interest is total ship combat system assessment for ship self defense, given by the Probability of Raid Annihilation (PRA) Measure of Effectiveness (MOE). According to the DoD's Director of Test & Evaluation (DOT&E), assessment of the PRA MOE hinges on effective use of modeling and simulation. A Navy PRA assessment process strategy has been established, with distributed, interoperable simulations in a central role. Each new ship class will develop a 'PRA federation' that is supported by validation efforts using live test events.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Saylor	Annie V.		Validation of Analytical Forward-Scattering Prediction Model		Proceedings of the 1992 Summer Computer Simulation Conference in Reno, Nevada, pp. 816-820					1992			From Old DMSO VV&A Bibliography: Example of validation by comparison with data
Schliessmann	J. E.		Formal Review of the Cruise Missile Effectiveness and Survivability Simulation (CMESS) (U)		Center for Naval Analyses Research Memorandum 90-234 (900234.00)					1991			From Old DMSO VV&A Bibliography: Model review case history
Schulmeyer	G. Gordon	Garth Mackenzie	Verification and Validation of Modern Software-Intensive Systems		Prentice-Hall PTR	ISBN: 0-13-020584-2				2000	V&V, software intensive systems	Table of Contents: 1. Introduction, 2. Processes, Models and Standards, 3. Tools and Methodologies, 4. Documentation, 5. Metrics, 6. Object Oriented (OO) Methods, 7. Rapid Application Development (RAD), 8. Graphical User Interface (GUI) Development—Usability, 9. Client / Server Networks, 10. Knowledge Based Systems (KBS), 11. Internet and Intranet, 12. Data Warehousing, 13. Project Management, 14. Risk Management, 15. Integrated Product Teams (IPTs), 16. Conclusion / Future Trends, Appendix A: Case Studies, Appendix B: Acronyms.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu

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Schultz	E.	J. Shepherd	Validation of Detailed Reaction Mechanisms for Detonation Simulation	Explosion Dynamics Laboratory Report FM99-5; available at http://www.galcit.caltech.edu/EDL/publications/reprints/galcit_fm99-5.pdf (accessed August 2002)	Graduate Aeronautical Laboratories, California Institute of Technology, Pasadena, CA 91125				1-242	36564	explosive validation	Abstract: This report considers the adequacy of existing detailed reaction mechanisms for use in detonation simulation with chemical systems containing hydrogen, ethylene, and propane fuels. Shock tube induction time data are compiled from the literature and compared to detonation thermodynamic conditions to establish validation limits. Existing detailed reaction mechanisms are then used in constant-volume explosion simulations for validation against the shock tube data. A quantitative measure of mechanism accuracy is obtained from the validation study results, and deficiencies in the experimental data and reaction mechanisms are highlighted. Two mechanisms were identified which include the chemistry for all three fuels and simulated the experimental induction time data to within an average factor of three for temperatures above 1200 K. These mechanisms are incorporated into steady, one-dimensional detonation simulations to provide quantitative information on the reaction zone structure, characteristic reaction time/length scales, and activation and thermal energy parameters.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Serrano	S.E.		Analytical Solutions of the Nonlinear Groundwater Flow Equation in Unconfined Aquifers and the Effect of Heterogeneity	Water Resources Research			AIAA-98-2687		10	1998			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Simpkins	Scott D.	Eugene P. Paulo, Lyn R. Whitaker	Case Study In Modeling And Simulation Validation Methodology	Proceedings of the 2001 Winter Simulation Conference	Society for Computer Simulation International					Dec-01	validation, Wargame 2000	The paper focuses on practical validation from the analyst's perspective in the form of a case study. The platform used is the theater missile defense (TMD) aspects of Extended Air Defense Simulation (EADSIM) and a new simulation called Wargame 2000.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Simpkins	Scott D.	Eugene P. Paulo & Lyn R. Whitaker	CASE STUDY IN MODELING AND SIMULATION VALIDATION METHODOLOGY	Proceedings of the 2001 Winter Simulation Conference, B. A. Peters, J. S. Smith, D. J. Medeiros, and M. W. Rohrer, eds.; available at http://www.informs-cs.org/wsc01papers/099.PDF (accessed August 2002).	Society for Computer Simulation (SCS)					Jun-05	validation, case history	Focus on practical validation from the analyst's perspective in the form of a case study. The platform used is the theater missile defense (TMD) aspects of Extended Air Defense Simulation (EADSIM) and a new simulation called Wargame 2000. The focus is not to validate Wargame 2000 but to develop real, usable tools for analysis. Measures of effectiveness include defense battery search, engagement and intercept times against threat missiles. Insight is provided into developmental and data production issues making the validation process more effective and meaningful.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Sindir	M.M.	Lynch, E. D.	Overview of the State-of-Practice of Computational Fluid Dynamics in Advanced Propulsion System Design	AIAA						Jun-05		Abstract: In the design of advanced propulsion systems, computational modeling plays a major role in defining the required performance over the flight envelope and testing the sensitivity of the design to the various modes of operation (e.g. rocket, ramjet, scramjet). Computational modeling techniques primarily computational fluid dynamics (CFD), together with select ground and flight testing, are expected to be the engineering tools of choice in the new Air Force and NASA space propulsion programs. This places a premium on the development of the next generation computational tools that can be used effectively in a design environment by nonspecialists. Experience gained from use of the current tools is essential to the successful development of the new tools.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov

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Singhal	Ashok K.		Key Elements of Verification and Validation of CFD Software		AIAA		Rept. 500-234			Jun-05		Abstract: The verification and validation of CFD software is of utmost importance for the reliability and hence for the success of CFD technology in industry. This paper discusses the relative importance, key elements, and some examples of: - Verification of numerical models and computer software, - Validation of solutions against benchmark data; and - Calibration of the models and analysis process. Out of these, the main emphasis is placed on verification. This is in light of the growing generality and complexity of CFD software (in response to continuously increasing expectations in industry). Finally, three key success factors for effective utilization of CFD technology are pointed out. These are 1) Verifications and Validation of software; 2) Skills of the Users; and 3) Vision, and commitment of the manager(s).	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Singhal	Ashok K.		Key elements of verification and validation of CFD software	AIAA Paper 98-2639 (AIAA Accession number 32825)	AIAA, Fluid Dynamics Conference, 29th, Albuquerque, NM					June 15-18, 1998	verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Slater	J. W.	J. C. Dudek and D. O. Davis	Validation and verification of the wind code for supersonic diffuser flow	AIAA Paper 2001-0224 (AIAA Accession number 16138)	AIAA, Aerospace Sciences Meeting and Exhibit, 39th, Reno, NV, Jan. 8-11, 2001					Jan. 8-11, 2001	verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Slater	J.W.	Dudek, J. C.; Tatum, K. E.	The NPARC Alliance Verification and Validation Archive		American Society of Mechanical Engineers					2000			William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Smith	M. D.	and D. J. Robson	Object-Oriented Programming - the Problems of Validation		Proceedings of the IEEE Conference on Software Maintenance 1990, IEEE Computer Society Press ISBN 0-8186-2091-9, pp. 272-281					1990	Object-oriented, validation		From Old DMSO VV&A Bibliography: Useful identification of potential object-oriented program validation problems
Springer	A.M.		Comparison of the Aerodynamic Characteristics of Similar Models in two Different Size Wind Tunnels at Transonic Speeds		AIAA		AIAA-2000-1001			Jun-05		Abstract: The aerodynamic characteristics of two similar models of a lifting body configuration were run in two transonic wind tunnels • one a 16•foot and the other a 14•inch are compared. The 16•foot test used a 2•percent model while the 14•inch test used a 0.7•percent scale model. The wind tunnel model configurations varied only in vertical tail size and the 2•percent model had an aft sting shroud. The results from these two tests compare the effect of tunnel size, Reynolds number, and dynamic pressure on the longitudinal aerodynamic characteristics of the vehicle. The data accuracy and uncertainty are also presented. It was concluded from these tests that the data resultant from a small wind tunnel compare very well to that of a much larger wind tunnel in relation to total vehicle aerodynamic characteristics.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Sreenivas	K.	C. Burg, D. Hyams and B. Mitchell	Unstructured Nonlinear Free Surface Flow Solutions: Validation and Verification	AIAA Paper 2002-2977	32nd AIAA Fluid Dynamics Conference and Exhibit						verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com

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Srinivasan	R.		Accurate Solutions for Steady Plane Flow in the Driven Cavity. I. Stokes Flow	Zeitschrift fur Angewandte Mathematik und Physik			AIAA-97-1889		383-397	Jun-05		Abstract: The incompressible plane flow generated by uniform translation of the upper wall in a rectangular cavity has received considerable attention in the literature because of the complex flow characteristics exhibited in a relatively simple geometry. This problem has been previously studied numerically using various techniques, including finite-difference, multigrid, spectral, finite element and integral equation methods. For the Stokes flow problem (zero Reynolds number) analytical solutions based on eigenfunction expansions have been derived by Joseph and Sturges and Shankar. The driven cavity problem has also been of great interest as a test problem for evaluating numerical procedures for solving the Navier-Stokes equations.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Standley	Vaughn	Helmuth Boeck, Reinhard Viertl	An Investigation of Fidelity Metrics by the Validation of a Safeguards Monitoring System Simulation	Proceedings of the 2000 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Orgranization					Sep-00	validation	This paper discusses the design and validation of a distributed safeguards monitoring system (SMS) simulation is conducted as a means of investigating fidelity metrics. Fitness defines the validity of the simulation.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Stanley	Walter L.		Verification, Validation, and Accreditation of Distribued Simulators		Position Paper Prepared for the Seventh Workshop On Standards for The Interoperability of Defense Simulations, Orlando, Florida					1992	Verification, Validation, Accreditation		From Old DMSO VV&A Bibliography: States VV&A Problem and the BDS-D approach
Steele	Lowell W.		Managing Technology, The Strategic View		McGraw Hill		pg 118			Jun-05	Risk quantification	An approach to quantifying risk	Dave Hall; 760-446-4624;daveh@survice.com
Steele	Lowell W.		Managing Technology, The Strategic View		McGraw Hill		pg 118			1989	Risk quantification	An approach to quantifying risk	Dave Hall; 760-446-4624;daveh@survice.com
Stengel	Karl		The eleven steps in validation, verification, and accreditation (VV&A)	AIAA Paper 2000-4585 (AIAA Accession number 37296)	AIAA Modeling and Simulation Technologies Conference, Denver, CO					Aug. 14-17, 2000	verification, validation, accreditation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Stern	F.	R. Wilson	verification and validation for RANS simulation of a naval surface combatant	AIAA Paper 2002-0904 (AIAA Accession number 14055)	AIAA Aerospace Sciences Meeting & Exhibit, 40th, Reno, NV,					Jan. 14-17, 2002	verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Stevenson	D. E.		A Critical Look at Quality in Large Scale Simulations	Computers in Science and Engineering					53-63	1999		Pulls together Les Hatton's experiments and the "Safer C" book	D. E. Stevenson, (864) 656-5880, steve@cs.clemson.edu
Stevenson	D. E.		A Critical Look at Quality in Large-Scale Simulations	IEEE Computing in Science and Engineering	IEEE Computer Press				53-63	1999		Applications of Hatton's ideas.	Stevenson/864-656-5880/steve@cs.clemson.edu
Stevenson	D. E.		A Foundation for Validation: the Michelson-Morley Experiment	Proc. 13th European Simulation Multi-conference, Warsaw Poland, 1-4 Jun 1999					269-275	1999		Explores the M-M experiment as a model verification exercise. Explicates basic nature of validation.	D. E. Stevenson, (864) 656-5880, steve@cs.clemson.edu
Stevenson	D. E.		A Foundation for Validation: The Michelson-Morley Experiment	Proceedings of the European Simulation Multiconference 1999.	SCS				269-275	1999		Derivation of validation criteria as exercise applied to MM. Expanded version available from author.	Stevenson/864-656-5880/steve@cs.clemson.edu
Stevenson	D. E.		An Evidence-Based Approach to Fidelity	Proc. SCSC '01, Orlando FL, 116-18 Jul, 2001.					CD version	2001		Uses Bayesian approach to Computing measure of validation based	D. E. Stevenson, (864) 656-5880, steve@cs.clemson.edu
Stevenson	D. E.		An Evidence-Based Approach to Fidelity	SCS. Proceedings of SCS01, Orlando Fl, 16-18 July, 2001.						CD: 16 Jul 2001		Develops a quantitative basis for VV&A studies based on the logical structure of the project.	D. E. Stevenson/865-656-5880/steve@cs.clemson.edu
Stevenson	D. E.		How Do You Know Your Simulation is Right?	1st SIAM Conference on Computational Science and Engineering, Washington DC, 20-24 Sep 2000.					Talk	2000		Significance is that this is the first ever SIAM meeting on CSE.	D. E. Stevenson, (864) 656-5880, steve@cs.clemson.edu
Stevenson	D. E.		Science, Computational Science, and Computer Science: At a Crossroads	Communications of the ACM				vol 37, no 12	85-96	1994		Complete philosophical grounding for computational science and engineering including the principles of validation.	D. E. Stevenson, (864) 656-5880, steve@cs.clemson.edu
Stevenson	D. E.		Software Engineering Frontiers in Computational Science and Engineering	Proc. 33d Annual ACM Southeast Conference, 8-10 April 1992.					41821	1992		Early attempts to wake software engineers up about verification and validation.	D. E. Stevenson, (864) 656-5880, steve@cs.clemson.edu

Lead Author Last Name	Lead Author First Name & MI	Other Authors	Item Title	Journal/Book Title	Publisher	ISBN/ISSN	Chapter or Volume	Edition/Issue (volume may be in column to left)	Pages	Publication Date	Keywords	Annotation (2-3 sentences about item significance)	Item submitted by (name/phone/email)
Stevenson	D. E.		The Michelson-Morley Experiment as a Primer on Validation	Computers in Science and Engineering				Submitted		Jun-05			D. E. Stevenson, (864) 656-5880, steve@cs.clemson.edu
Stevenson	D. E.		Verification and Validation of Complex Systems	ANNIE Conference, ST. Louis, Mo, Nov, 2002				Submitted		2002		This paper ties verification and validation together as two sides of the same coin. The principle here is set forth as a possible formal methods approach.	D. E. Stevenson, (864) 656-5880, steve@cs.clemson.edu
Stone	Tim	Robert F. Richbourg, Robert J. Graebener, & Keith Green	Verification And Validation (V & V) Of Federation Synthetic Natural Environments	Proceedings of the Interservice/Industry Training, Simulation and Education Conference	National Training Systems Association (NTSA)					37196	verification, validation, synethic environment	This paper addresses V&V of federated synthetic environments.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Sullivan	Cindy	Jennifer Chew	TECOM M&S VV&A Methodology – A Cookbook Approach	Proceedings of the 1999 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Orgranization					36220	verification, validaiton	This paper discusses why the U.S. Army Test and Evaluation Command (TECOM) developed a Verification, Validation and Accreditation (VV&A) methodology, summarizes the contents of the methodology, and shares some of the lessons learned.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Sullivan	Cindy	Jennifer Chew	Verification & Validation: International Credibility Levels for T&E	Proceedings of the 2001 International Test and Evaluation Association (ITEA) ITEA Modeling and Simulation Conference, December 3-6, 2001	International Test and Evaluation Association					Dec-01	verification, validation	The V&V working group is responsible for preparing an ITOP consisting of procedures and guidance documentation on the optimum use of V&V and on how to transfer information from the V&V process to other nations. The purpose of the V&V ITOP is to provide standard guidance for the V&V of models and simulations that are associated with test and evaluation and to increase the credibility of those models and simulations.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Sullivan	Cindy	Jennifer Chew	Verification, Validation, And Accreditation In The Life Cycle Of Models And Simulations	Proceedings of the 2000 Winter Simulation Conference	Society for Computer Simulation International					36861	verification, validation, accreditation	This paper discusses the activities and tasks during the early stages of model development and addresses each of the VV&A efforts separately, along with its associated activities. It outlines the specific VV&A activities and products that are appropriate to each phase of model development.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Summa	J. M.	J. M. Barton	CFD verification and validation in commercial design and analysis	AIAA Paper 98-2640 (AIAA Accession number 32826)	AIAA, Fluid Dynamics Conference, 29th, Albuquerque, NM					June 15-18, 1998	verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Summa	J.M.	Barton, J. M.	CFD Verification and Validation in Commercial Design and Analysis		AIAA							Abstract: The processes of verification and validation are discussed and illustrated in the business context of combined software sales, design services, and customer support for aircraft certification. The processes are shown to be ongoing efforts, rather than once-for-all-times, and are highlighted with application to business jets and commercial transports. Particular needs are addressed in the case of complete aircraft configurations.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Sundaresan	S.	Nagarajan, S.; Deshpande, S. M.; Narasimha, R.	2D Lid-Driven Cavity Flow at High Reynolds Numbers: Some Interesting Fluid-Dynamical Issues		Springer-Verlag							Abstract: Solutions currently considered to provide the bench-mark for 2-D lid-driven cavity flow are shown here to be are not grid-independent. Using clustered grids and a time-accurate multi-grid code, grid-independent solutions are reported here at Reynolds number Re =3D 100 and 400 (based on lid velocity and cavity size). Preliminary solutions are presented also at Re =3D 3200 and 10000. It is found that fine resolution near the wall is necessary to obtain the solution accurately even in the core of the cavity. The solutions presented here call into question both the theories proposing an asymptotically constant core vorticity in the limit of infinite Reynolds numbers, and current interpretations of experimental data.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov

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Sung	C.H.	Fu, T. C.; Griffin, M. J.; Huang, T. T.	Validation of Incompressible Flow Computation of Forces and Moments on Axisymmetric Bodies at Incidence		AIAA							Abstract: A numerical approach based on multiblock, multigrid, local refinement and preconditioning methods has been developed to solve the incompressible Reynolds•averaged Navier•Stokes (RANS) equations. Three•dimensional flow computations for four axisymmetric bodies at angles of attack of 0, 4, 8, 12, and 16 degrees are presented. The definitions of a converged solution and grid•independent solution are given appropriate for engineering problems. Two measures of computational and experimental errors are also given for systematic assessment of errors. Computations on four grids: 24x8x12, 48x24x32, 96x32x48 and 144x48x72 were performed to study the behavior of convergence and grid sensitivity. It is concluded that the solution with the 144x48x72 grid is both converged and grid independent. The convergence rate is fast and is on the order of 1.5x10•5 cpu second per grid point per multigrid cycle based on a computation on a grid with 0.5 million grid cells on a single Cray C90 processor. The accuracy in the prediction of the forces and moments at various incidence angles is as good as the experimental acc	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Susceptibility Model Assessment and Range Test (SMART)			Configuration Management Requirements Study		JTCG/AS				103	34700		This report documents the Configuration Management (CM) requirements study performed by Booz•Allen & Hamilton Inc. for the Susceptibility Model Assessment and Range Test (SMART) project. The objective of the CM requirements study was to develop generic C	E. Ketcham/760-939-4251/ketchamej@navair.navy.mil
Syed	S. A.		Validation of CFD Codes for Inlet Flows		Pratt & Whitney for the Computational Fluid Dynamics Code Validation/Calibration JANNAF Airbreathing Propulsion Subcommittee Workshop - High-Speed Inlet Forebody Interactions (The Johns Hopkins University) NTIS, pp. 197-214					1991	Validation		From Old DMSO VV&A Bibliography:
Tassey	Gregory	RTI	The Economic Impacts of Inadequate Infrastructure for Software Testing		National Institute of Standards Acquisition and Assistance Division	Planning Report 02-3			309	37377	Software Quality, Software Testing, Testing Infrastructure, costs	A discussion of the impacts of insufficient testing resources for software, in terms of Nationwide economics	Dave Hall; 760-446-4624;daveh@survice.com
Tassey	Gregory	RTI	The Economic Impacts of Inadequate Infrastructure for Software Testing		National Institute of Standards and Technology Acquisition and Assistance Division	Planning Report 02-3			309	May-02	Software Quality, Software Testing, Testing Infrastructure, costs	A discussion of the impacts of insufficient testing resources for software, in terms of Nationwide economics	Dave Hall; 760-446-4624;daveh@survice.com
Tepandi	J.		Verification, Testing, and Validation of Rule-Based Expert Systems		Proceedings of the 11th IFAC World Congress, Vol. 7, pp. 162-167					1990			From Old DMSO VV&A Bibliography:
Tolk	Andreas	n/a	Non-Monotonicities in HLA Federations	Proceedings 1999 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Organization	n/a	n/a	n/a	8	36220	structural variances, discontinuities, multi-resolution federations	Implications for V&V derived from harmonization necessities in multi-resolution federations.	Andreas Tolk / 757.686.6203 / atolk@odu.edu
Tripp	Bruce R.	Bradford S. Canova, Peter H. Christensen, Michael D. Lee, Michael H. Pack, David L. Pack	Simulation To Support Operational Testing: A Practical Application	Proceedings of the 1999 Winter Simulation Conference	Society for Computer Simulation International					36495	verification, validation, Predator SRAW	This paper describes a combined effort between the Marine Corps Systems Command (MARCORSYSCOM), the Marine Corps Operational Test and Evaluation Activity (MCOTEA) and the MITRE Corporation to exploit M&S to support Operational Test (OT) of the Predator Short Range Assault Weapon (SRAW).	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com

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Trucano	T.G.	Easterling, R. G.; Dowding, K. J.; Paez, T. L.; Urbina, A.; Romero, V. J.; Rutherford, R. M.; Hills, R. G.	Description of the Sandia Validation Metrics Project		Sandia National Labs								William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Trucano	Timothy G.	Robert G. Easterling, Kevin J. Dowding, Thomas L. Paez, Angel Urbina, Vicente J. Romero, Brian M. Rutherford, and Richard G. Hills	Description of the Sandia Validation Metrics Project		Sandia National Laboratories, SAND Report SAND2001-1339					August 2001	validation, quantification, uncertainty	Descried underlying principles and goals of the Sandia Accelerated Strategic Computing Initiative (ASCI) V&V program validation metrics project/	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Trucano	Timothy G.		Prediction and Uncertainty in Computational Modeling of Complex Phenomena: A Whitepaper		Sandia National Labs							Abstract: This report summarizes some challenges associated with the use of computational science to predict the behavior of complex phenomena. As such, the document is a compendium of ideas that have been generated by various staff at Sandia. The report emphasizes key components of the use of computational to predict complex phenomena, including computational complexity and correctness of implementation, the nature of the comparison with data, the importance of uncertainty quantification in comprehending what the prediction is telling us, and the role of risk in making and using computational predictions. Both broad and more narrowly focused technical recomendations for research are given. Several computational problems are summarized that help to illustrate the issues we have emphasized. The tone of the report is informal, with virtually no mathematics. However, we have attempted to provide a useful bibliography that would assist the interested reader in pursuing the content of this report in greater depth.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Van Wie	D.M.	Rice, T.	Quantification of Data Uncertainties and Validation of CFD Results in the Development of Hypersonic Airbreathing Engines		AIAA							Abstract: The developing process for hypersonic airbreathing engines is evolving, and the validation of computational and experimental techniques plays an increasingly vital role as a greater understanding of the physical processes is realized. A series of examples is provided to illustrate some of the important aspects of this validation. Sample engine calculations are used to estimate the required accuracies needed for the validation process. Techniques for the measurement of scramjet performance are considered to illustrate the difficulties encountered in collecting data for the validation process. The need to carefully assess measurement uncertainties and propagate these uncertainties through analysis procedures is discussed. Finally, the need to understand trends and sensitivities is described.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
VanderVliet	G. M.	C. H. Wilkinsonand M. F. Roscoe	Verification. validation, and accreditation of flight simulator: The JSHIP experience	AIAA Paper 2001-4061 (AIAA Accession number 37379)	AIAA Modeling and Simulation Technologies Conference and Exhibit, Montreal, Canada					Aug. 6-9, 2001	verification, validation, accreditation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com

Lead Author Last Name	Lead Author First Name & MI	Other Authors	Item Title	Journal/Book Title	Publisher	ISBN/ISSN	Chapter or Volume	Edition/Issue (volume may be in column to left)	Pages	Publication Date	Keywords	Annotation (2-3 sentences about item significance)	Item submitted by (name/phone/email)
Veazey	D.T.	Hopf, J. C.	Comparison of Aerodynamic Data Obtained in the Arnold Engineering Development Center Wind Tunnels 4T and 16T		AIAA							Abstract: Arnold Engineering Development Center (AEDC) wind tunnels 4T and 16T have evolved into productive wind tunnel test facilities. Both tunnels are noted for achieving outstanding flow quality and producing high quality data. Tunnel•to•tunnel comparisons of aerodynamic, store separation, and tunnel calibration data will be presented to reinforce this tenet. The data are presented at subsonic, transonic, and low supersonic Mach numbers, and have been obtained over a span of several years in the AEDC test facilities. The test articles include a 1/5-scale model of a typical missile used to acquire aerodynamic static stability data and a 1/15-scale model of a slender body missile shape employed for store separation testing. The test conditions evaluated include Mach numbers from 0.4 to 1.6, model angles of attack from -27 to 27 deg, and Reynolds numbers from 1.1 to 2.5 million/ft.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Venkatapathy	Ethiraj	Dinesh K. Prabhu, Michael J. Wright, Joseph G. Marvin, and James L. Brown	X-33 aerothermal design environment predictions - verification and validation	AIAA Paper 2000-2686 (AIAA Accession number 33735)	AIAA Thermophysics Conference, 34th, Denver, CO					June 19-22, 2000	verification, validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Venkateswaran	S.	Merkle, C. L.	Evaluation of Artificial Dissipation Models and Their Relationship to the Accuracy of Euler and Navier-Stokes Computations		Springer-Verlag							Abstract: Perturbation analysis is used to examine the forms that artificial dissipation models take in the low Mach number, low Reynolds number and unsteady limits. Standard scalar and matrix dissipation models as well as the Rhie-Chow procedure are analyzed. The overall conclusion is that appropriate preconditioning scaling generally ensures that the dissipation terms are well-conditioned under the limiting conditions. For high frequency unsteady computations, however, our results indicate that the scalar and matrix dissipation models may introduce excessive dissipation in the momentum equation, while the Rhie•Chow method appears well-behaved.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Venkayya	V. B.		Analytical Certification of Aircraft Structures		NATO Advisory Group for Aerospace Research and Development (AGARD) Report No. 772 Analytical Qualification of Aircraft Structure. NTIS, paper #3					1990			From Old DMSO VV&A Bibliography: Valuable paradigm for NWSA&E problem
Verhoff	A.	Cary, A.	Analytical Euler Solutions for 2D Flows with Corners using Asymptotic Methods		AIAA							Abstract: A newly-developed procedure for obtaining analytical asymptotic solutions of the 2D steady-state Euler equations is applied to compressible flows with geometric corners. The equations are written in natural streamline coordinates with mass flux and flow angle as dependent variables. Higher-order compressibility and rotationality effects appear as non-homogeneous forcing terms. This new solution approach does not require a Green's function for the forcing terms and thus general applicability to Poisson equations and non-homogeneous Cauchy-Riemann systems. It therefore has application to many other disciplines (e.g., heat transfer) besides fluid dynamics. Application of the new approach to flow problems with geometric corners reveals the typical singularity compounding at higher order. The analytical nature of the solutions guides implementation of coordinate straining to control the phenomenon. Closed-form asymptotic solutions with coordinate straining are likewise straightforward. Solutions of this type can serve as	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov

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Verhoff	A.		Complementing Numerical Simulation Methods with Classical Analytical Techniques		AIAA							Abstract: New aerospace vehicle designs must have greater performance and versatility at affordable cost. This requires multi•disciplinary analysis and optimization which in turn requires more accurate and efficient numerical simulation tools. The need for greater accuracy and efficiency of Computational Fluid Dynamics (CFD) tools is further amplified by the industry trend toward distributed computing and away from supercomputers. Complementary analytical methods coupled with traditional CFD approaches offer the means for increased simulation capability by incorporating more essential physics into solution algorithms and reducing reliance on grid density for achieving accuracy. This paper describes activities directed at improving affordability of CFD tools with complementary analytical techniques. Results have proven very successful. Several examples of ongoing work are discussed, including analytical•based aerodynamic analysis and design optimization methods and improved far•field boundary conditions for CFD codes. These examples illustrate the synergism that	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Verhoff	A.		Far-Field Computational Boundary Conditions for Three-Dimensional External Flow Problems		AIAA							Abstract: Higher-order far-field computational boundary conditions have been developed for CFD (Computational Fluid Dynamics) calculation of inviscid external flows. They are derived from analytic solutions of an asymptotic form of the three-dimensional, steady state Euler equations and have improved accuracy compared to commonly-used characteristic boundary conditions. The analytic solutions provide for a smooth transition across the boundary to the true far-field conditions at infinity. The Euler equations are asymptotically linearized about this constant pressure, rectilinear flow condition. This development is an extension of previous work for two-demensional flows. Because the Euler equations are used to develop the boundary conditions, the flow crossing the boundary can be rotational (i.e., applicable to transonic flow calculations). The boundary conditions can be used with any numerical Euler solution method and allow computational boundaries to be located very close to the nonlinear region of interest. This leads to a significant reduction in the number of grid points required for a	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Viertl	Reinhard	Vaughn Standley, Helmuth Boeck	An Investigation of Fidelity Metrics by the Validation of a Safeguards Monitoring System Simulation	Proceedings of the 2000 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Orgranization					36770	validation	Design and validation of a distributed safeguards monitoring system (SMS) simulation is conducted as a means of investigating fidelity metrics. The research goal is to create a simulation of an SMS where the data can be compared with that of a laboratory referent. In this, the first phase of study, agreement between simulation and referent data is analyzed in the context of the simulation objective using rigorous statistical methods and expressed in terms of a fitness metric. Fitness defines the validity of the simulation.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Viertl	Reinhard		Statistical Methods for Non-Precise Data		CRC Press, Inc.								William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Wallace	Dolores R.	and John C. Cherniavsky	Guide to Software Acceptance		National Institute of Standards and Technology (NIST) Special Publication 500-180					1990			From Old DMSO VV&A Bibliography:

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Wallace	Dolores R.	Ippolito, Laura M.; Cuthill, Barbara B.	Reference Information for the Software Verification and Validation Process									Abstract: Computing systems may be employed in the health care environment in efforts to increase reliability of care and reduce costs. Software verification and validation (V&V) is an aid in determining that the software requirements are implemented correctly and completely and are traceable to system requirements. It helps to ensure that those system functions controlled by software are secure, reliable, and maintainable. Software V&V is conducted throughout the planning, development and maintenance of software systems, including knowledge•based systems, and may assist in assuring appropriate reuse of software.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Warlock	Arwen M.	Gregory L. Mealy	Dynamic System Model Validation And Simulation	Proceedings of the 2000 Society For Computer Simulation Conference	Society for Computer Simulation International					36708	validation	The Airframe Coefficient Estimation System (ACES) implements a parameter estimation–based model validation approach applicable to nonlinear dynamical system models. Model parameter estimates are determined as corrections to an a priori model by processing measured system response in an extended Kalman filter (EKF).	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Wets	Geert	Frank Witlox	VERIFICATION AND VALIDATION OF KNOWLEDGE-BASED SYSTEMS: AN EXAMPLE TAKEN FROM URBAN LAND USE PLANNING	http://stratema.sigis.net/cupum/pdf/D13.pdf; accessed 7 April 2002							verification & validation, site selection, decision tables, urban planning, KBS	In the context of decision tables (DTs), it has been claimed from the early years of DT research onwards that DTs are very suited for verification purposes of Knowledge-Based Systems (KBS). However, in most cases, proper validation of DTs has been neglected. Therefore, it will be explained in this paper how validation of the modelled knowledge can be performed. In this respect, use is made of stated response modelling designs techniques to select decision rules from a DT. Our approach is illustrated using a case-study dealing with the locational problem of a (petro)chemical company in a port environment. The KBS developed has been named MATISSE.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu; key words & annotation from paper abstract.
Whitaker	Lyn R.	Scott D. Simpkins, Eugene P. Paulo	Case Study In Modeling And Simulation Validation Methodology	Proceedings of the 2001 Winter Simulation Conference	Society for Computer Simulation International					37226	validation, Wargame 2000	The paper focuses on practical validation from the analyst's perspective in the form of a case study. The platform used is the theater missile defense (TMD) aspects of Extended Air Defense Simulation (EADSIM) and a new simulation called Wargame 2000.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Whitehead	Steven K.		Modeling and Simulation - A New Role for the Operational Tester	Program Manager	Defense Systems Management College			Vol. XXVI, No. 5 DSMC 140	132	Sep-Oct 97	operational testing, modeling and simulation, verification, validation, accreditation	Modeling and simulation (M&S) is a tool to more effectively and efficiently employe limited test assets. M&S can be used very successfully in test planning, rehearsals, training, post-test analysis, and in limited cases, the test itself.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Wilkinson	C. H.	G. M. VanderVliet and M. F. Roscoe	Verification. validation, and accreditation of flight simulator: The JSHIP experience	AIAA Paper 2001-4061 (AIAA Accession number 37379)	AIAA Modeling and Simulation Technologies Conference and Exhibit, Montreal, Canada					Aug. 6-9, 2001	verification, validation, accreditation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Williams	Dr. Marion L.		Simulation Trends and Issues		Air Force Operational Test and Evaluation Command (AFOTEC) Briefing					1992			From Old DMSO VV&A Bibliography:
Williams	Marion		SIMVAL Mini-symposium -- A Report		PHALANX, 24, No. 2, pp. 1, 3-6					1991			From Old DMSO VV&A Bibliography:
Wilson	R.	F. Stern	verification and validation for RANS simulation of a naval surface combatant	AIAA Paper 2002-0904 (AIAA Accession number 14055)	AIAA Aerospace Sciences Meeting & Exhibit, 40th, Reno, NV,					Jan. 14-17, 2002	verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Wise	Ben P.		Self-Calibration in Combat Models		Proceedings of the 1992 Summer Computer Simulation Conference in Reno, Nevada, pp. 1007-1014					1992			From Old DMSO VV&A Bibliography: Addresses aggregation in DIS

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Wood	Kimberly S.	LCDR Vincent M. Ortiz	A Cooperative Accreditation Process in Support of Operational Testing	Proceedings of the 2000 International Test and Evaluation Association Modeling and Simulation Workshop	International Test and Evaluation Association					36861	verification, validation, accreditation process	This paper discusses a practical process that presents the required credibility to the end user in a disciplined manner and is sufficiently flexible to apply to most simulations.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Wright	Michael J.	Dinesh K. Prabhu, Joseph G. Marvin, James L. Brown, and Ethiraj Venkatapathy	X-33 aerothermal design environment predictions - verification and validation	AIAA Paper 2000-2686 (AIAA Accession number 33735)	AIAA Thermophysics Conference, 34th, Denver, CO					June 19-22, 2000	verification, validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Wymore	Wayne, A.		Model-based Systems Engineering: An Introduction to the Mathematical Theory of Discrete Systems and to the Tricotyledon Theory of System Design		Boca Raton: CRC					1993			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Yilmaz	L.		Issues in the Certification of Reusable Object-Oriented Model Components: The Coordination Perspective	Proceedings of the 2000 International Conference on Web-Based Simulation and Modeling					55-61	2000	reuse, object oriented		
Yilmaz	L.		Verification and Validation Guidelines for Object-Oriented Simulation Models	Proceedings of the 1998 Summer Computer Simulation Conference, July 19-22, 1998	Society for Computer Simulation International				645-646	1998	verifaction, validation, object oriented		
Youngblood	Simone M.	Dale K. Pace	An Overview of Model and Simulation Verification, Validation, and Accreditation	Johns Hopkins APL Technical Digest	Johns hopkins University Applied Physics Laboratory			Vol. 16/No. 2	197-206	April-June 1995	VV&A	An overview of simulation VV&A as conducted within the Defense community.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Youngblood	Simone M.	D. K. Pace, P. L. Eirich, D. N. Gregg, and J. E. Coolahan	Simulation Verification and Validation (V&V)	Johns Hopkins APL Technical Digest	Johns hopkins University Applied Physics Laboratory			Vol. 21/No. 3	359-367	July-September 2000	VV&A	Present an overview of VV&A work at APL, especially with its Joint Warfare Analysis Department, and relates that to VV&A within the Defense community.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Youngblood	Simone M.		The Joint Warfare System (JWARS) VV&A Effort: Challenges in VV&A of a Joint, Object-Oriented Development	PHALANK	Military Operations Research Society (MORS)				10-11, 34	35582	VV&A, JWARS, object-oriented	Describes JWARS VV&A challenges.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
Youngblood	Simone M.		Literature Review and Commentary on the Verification, Validation, and Accreditation of Models and Simulations		Proceedings of the 1993 Summer Computer Simulation Conference (Boston, Massachusetts)					1993			From Old DMSO VV&A Bibliography:
Zadeh	L.A.	Desoer, C.A.	Linear System Theory, The State Space Approach		New York McGraw Hill					1963			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Zeigler	B.P	Praehofer, H.; Kim, T. G.	Theory of Modeling and Simulation: Integrating Discrete Event and Continuous Complex Dybnamic Systems		Academic Press								William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Zeigler	Bernard P.	Hall, S.B. Sarjoughian, H.S.	Exploiting HLA and DEVS to Promote Interoperability and Reuse in Lockheed's Corporate Environment.	Simulation			1999. 73(5)		p. 288-295	1999			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Zeigler	Bernard P.	Ball, G. Sarjoughian, H.S.	Implementation of the DEVS Formalism over the HLA/RTI: Problems and Solutions.	Simulation Interoperability Workshop. 1999. Orlando, FL.									Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Zeigler	Bernard P.		Multi-Facetted Modeling and Discrete Event Simulation.		New York: Academic Press.					1984			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Zeigler	Bernard P.		Object-Oriented Simulation with Hierarchical, Modular Models: Intelligent Agents and Endomorphic Systems.		New York: Academic Press					1990			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Zeigler	Bernard P.	Jerzy W. Rozenblit, and Eric R. Christensen	Reducing the Validation Bottleneck with a Knowledge-Based, Distributed Simulation Environment		Expert Systems With Applications, Vol. 3, pp. 329-342					1991	Validation, Ada, Object-oriented		From Old DMSO VV&A Bibliography: See Bibliography for additional sources
Zeigler	Bernard P.	Praehofer, H. Kim, T.G.	Theory of Modeling and Simulation: Integrating Discrete Event and Continuous Complex Dynamic Systems, 2nd Edition		Academic Press.					2000			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Zeigler	Bernard P.	Praehofer, H. Kim, T.G.	Theory of Modeling and Simulation: Integrating Discrete Event and Continuous Complex Dynamic Systems. Second Edition		Academic Press.					2000			Sarjoughian, 480-965-3983, Sarjoughian@asu.edu
Zeman	A. R.		An Evaluation of PERMIT, The PERsonnel Management Integration Tool (U)		Center for Naval Analyses Research Memorandum 90-76 (900076.00)					1990			From Old DMSO VV&A Bibliography: Model review case history

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Zhang	Jackie Zheqing	Bill Hopkinson and Sheau-Dong Lang	Static Analysis and Validation of Composite Behaviors in Composable Behavior Technology	Proceedings of the 2002 Spring Simulation Interoperability Workshop	Simulation Interoperability Standards Organziation					Mar. 10-15, 2002	validation	The goal of our research was to implement a tool that performs static analysis and validation of the behaviors defined using the CBT for ModSAF. Using advanced XML and JAVA technologies, together with graph algorithms, we developed a tool called LogicChecker to provide static behavior validation for behaviors created using the CBT methodology. Our static validation techniques perform assessment on the basis of the characteristics of the static model design and source code, prior to machine execution.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Zhang	X.D.	Trepanier, J. Y.; Camarero, R.	An A Posteriori Error Estimation Method Based on Error Equations		AIAA							Abstract: An error equation is proposed as a way to obtain error estimation for hyperbolic systems of conservation laws. The error equation behaves as the initial equation but is driven by a source term computed from the flux jump at interfaces. The error equation is solved simultaneously with the initial equation. Comparisons with exact error distributions show that the estimated error distribution is captured very well for all variables. A quantitative agreement can be obtained if higher•order schemes are used for the error equation.	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Zhang	X.D.	Pelletier, D.; Trepanier, J. Y.; Camarero, R.	Verification of Error Estimators for the Euler Equations		AIAA								William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
Zimmerman	David C.	Timothy K. Hasselmanand David L. Herendeen	An integrated FEA software capability for dynamic model validation and verification	AIAA Paper 99-1595 (AIAA Accession number 24886); Collection of Technical Papers. Vol. 4 (A99-24601 05-39)	AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference and Exhibit, St. Louis, MO					Apr. 12-15, 1999	verification and validation		Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
Zuzich	Lt. John (USN)		Why Are We Finding Errors in OPEVAL?	CrossTalk The Journal of Defense Software Engineering	Software Technology Support Center			Vol. 10, No. 10		35704	operational evaluation, software-intensive systems, program risk	The staff at Commander, Operational Test and Evaluation Force (COMOPTEVFOR) in Norfolk, Va. often discover problems in software-intensive systems as they go through operational evaluation. This article describes the ways COMOPTEVFOR can get involved early to minimize program risks.	Marcia Stutzman / (301) 317-9698 / mstutzman@northropgrumman.com
			An Accreditation Support Framework for DoD Models and Simulations	JTCG/AS-95-M-004			57	1	45-97	1995		Abstract: This document describes an incremental model and simulation (M&S) accreditation support process developed under the auspices of the Susceptibility Model Assessment and Range Test (SMART) Project. The SMART Project was commissioned by the Office of the Secretary of Defense (OSD) in FY92 to: (1) develop a process for improving the credibility of M&S used to support acquisition decisions for airborne weapon systems; (2) test the proposed process on a set of existing M&S widely used in the Department of Defense (DoD); and (3) transition the process and support infrastructure to DoD organizations for expansion of the methodology to other types of M&S. The accreditation support process developed to fulfill these objectives includes verification, validation and configuration management (VV&CM) activities, and it is divided into three sequential phases, each of which produces a set of accreditation support products at successively greater levels of detail. These products (called Accreditation Support Packages, or ASP's) provide a standard way to report VV&CM results, and they summarize the esse	William L. Oberkampf / Voice: (505) 844-3799 / Email: wloberk@sandia.gov
			Anotated Briefing for the Smart Project Proof of Concept		JTCG/AS-92-SM-019					1992	Verification, Validation, M/S Credibility		From Old DMSO VV&A Bibliography: case history - definition of assessment procedures for models and simulations used by testing community

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			Application of Verification, Validation, and Accreditation (VV&A) on Army Models and Simulations (Draft)		Department of the Army PAM 5-XX					1993			From Old DMSO VV&A Bibliography:
			Army Model and Simulation Management Program		Army Regulation 5-11					1992			From Old DMSO VV&A Bibliography:
			Defense Science and Technology Strategy		Director of Defense Research and Engineering (DDRE)					1992			From Old DMSO VV&A Bibliography: Articulates synthetics environments vision
			Development, Accreditation, and Enhancements of the Fire Support Command and Control Analysis Tool (FISCCAT)		Army Materiel Systems Analysis Activity (AMSAA) Briefing, FISCCAT 1992					1992			From Old DMSO VV&A Bibliography:
			Distributed Interactive Simulation (DIS) Model Verification, Validation and Accreditation Methodologies: Battlefield Distributed Simulator - Developmental (BDS-D) Model Verification, Validation, and Accreditation Plan		BDM International, Inc. Memorandum BDM/ABQ-92-0073-TR prepared for U. S. Army Simulation Training and Instrumentation Command					1992			From Old DMSO VV&A Bibliography:
			Draft STANDARD Missile Simulation Management Plan		Johns Hopkins University/Applied Physics Laboratory Internal Memorandum F1E(92)-U-2-387					1992			From Old DMSO VV&A Bibliography: Draft Plan
			Formal Verification of Digital Logic		Air Force Institute of Technology, Wright-Patterson AFB School of Engineering (AD - A243834)					1991	Verification		From Old DMSO VV&A Bibliography: Verification of digital circuits
			Guide for the Verification and Validation of Computational Fluid Dynamics Simulations	Guide for the Verification and Validation of Computational Fluid Dynamics Simulations	American Institute of Aeronautics and Astronautics (AIAA) G-077-1998	1-56347-285-6				1998	V&V, guide, CFD	A guide for how to V&V CFD simulations.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
			IEEE Draft Standard P1074/D4, Standard for Software Life Cycle Processes		IEEE P1074/D4					1990			From Old DMSO VV&A Bibliography:
			Information Processing Standards for Modeling and Simulation (Draft Report)		Defense Information Systems Agency (DISA)/Joint Interoperability and Engineering Organization (JIEO)					1992			From Old DMSO VV&A Bibliography: Assessment of M&S information processing standards and products
			Initial Accreditation Review of Selected Models		Space and Naval Warfare Systems Command (SPAWAR 30)					1992	Accreditation review		From Old DMSO VV&A Bibliography: Accreditation reviews of 14 SPAWAR/OPNAV models
			Integrated System Test Capability (ISTC) - Veriifcation, Validation, and Accreditation (VV&A) Preliminary Document		SDIO-SRS-92-1641					1992	Verification, Validation, Accreditation		From Old DMSO VV&A Bibliography: Approach to VV&A (multiple levels)
			Joint Modeling and Simulation Strategy (Draft)		Deputy Director for Technical Operations (J-8) The Joint Staff					1992			From Old DMSO VV&A Bibliography:
			Management of Experiment Data		SDIO Directive 3240					1990			From Old DMSO VV&A Bibliography:
			NPARC Alliance CFD Verification and Validation Web Site	Accessed at http://www.grc.nasa.gov/www/wind/valid/policies.html on 25 Feb 2002						URL accessed 25 Feb 2002		The NPARC Alliance is a partnership between the NASA Glenn Research Center (GRC) and the Arnold Engineering Development Center (AEDC) dedicated to the establishment of a national, applications oriented computational fluid dynamics (CFD) capability, centered on the NPARC computer program. Website includes policy, lessons learned, references, etc.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
			Operational Test and Evaluation Command (OPTEC) Interim Policy Guidance (IPG) 92-2, Verification, Validation and Accreditation (VV&A) of Modeling and Simulation (M/S) to Support or Supplement Operation Test and Evaluation (OT&E)		OPTEC IPG 92-2 US Army Operational Test and Evaluation Command Memo CSTE-MP (340d)					1992	Verification, Validation, Accreditation		From Old DMSO VV&A Bibliography:

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			Proposed IEEE Draft Standard Exercise Control and Performance Measures Feedback Requirements for Distributed Interactive Simulation (DIS)		Prepared by the Institute for Simulation and Training (University of Central Florida) for STRICOM, IST-CR-93-05					1993			From Old DMSO VV&A Bibliography:
			Proposed IEEE Draft Standard Fidelity Description Requirements for Distributed Interactive Simulation (DIS)		Prepared by the Institute for Simulation and Training (University of Central Florida) for STRICOM, IST-CR-93-04					1993			From Old DMSO VV&A Bibliography: Standards on fidelity issues relating to DIS
			Proposed Revision for CJCS MOP68 Basic Policy Guidance on Joint Modeling and Simulation Management		Joint Staff Action J-8 3002/118-00					1992			From Old DMSO VV&A Bibliography: Revision to entry #204
			References on V&V of Knowledge-Based Systems	Accessed at http://www.cs.bris.ac.uk/~dattani/TN-703.html on 25 Feb 2002						URL accessed 25 Feb 2002	V&V, Knowledge-based Systems	Useful references	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
			Report of the AD HOC Committee on M&S		Air Force Scientific Advisory Board					1991	Verificiation, Validation, Accreditation		From Old DMSO VV&A Bibliography: Study of issues to improve the use of Models and Simulations in support of system acquistion
			SAVVIE/ITEMS Verification & Validation Plan Overview		U. S. Army Materiel Systems Analysis Activity (AMSAA) Air Warfare Division Briefing					1992			From Old DMSO VV&A Bibliography:
			Software Policy		SDIO Directive 3405					1992			From Old DMSO VV&A Bibliography:
			Team M Report on Naval Warfare Modeling		Naval Warfare Analytical/Modeling Oversight Council (NMOC) - Team Mike, Chief of Naval Operations Memorandum Ser 732D/1U35					1991			From Old DMSO VV&A Bibliography: Assessment of state of the art (1991) M&S of naval warfare activities
			Test and Evaluation Verification, Validation and Accreditation (VV&A) Policy for the Strategic Defense Initiative Organization (SDIO) - Draft		SDIO Directive No. 5002					1992	Verification, Validation, Accreditation		From Old DMSO VV&A Bibliography: Procedures for VV&A
			The Navy's Air Defense and Related Threat Simulation and Validation Library	Website: http://www.ailtso.com/simval/library.htm (accessed August 2002)	Naval Air Warfare Center (NAWC)					revised 18 April 2002	threat, validation	Threat Simulation, Validation, and Modeling Documentation	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
			The Turing Test and Its Applicability to Credibility Testing of a Dynamic Simulation Model		Naval Postgraduate School (AD - B162953L)					1992	Verification, Validation		From Old DMSO VV&A Bibliography: Master's Thesis
			U. S. Army Training and Doctrine Command (TRADOC) Models and Simulation (M&S)		TRADOC Regulation 5-11					1991			From Old DMSO VV&A Bibliography:
			Validation of Navy Air Defense Threat Simulators		Naval Air Systems Command (NAVAIR) Instruction 3960					1992			From Old DMSO VV&A Bibliography:
			Validation of Navy Air Defense Threat Simulators		Office of the Chief of Naval Operations (OPNAV) Instruction 3960.15					1991			From Old DMSO VV&A Bibliography:
			Verification and Validation of Neural Nets, Final Report	Available at http://www.irecall.com/neural/nnindex.htm (accessed September 2002)	Instant Recall, Inc.					2000	neural nets	The purpose of this project was to define the problems involved in creating neural net applications that achieve their intended specifications and to find ways to verify and validate neural net	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
			Verification and Validation of SIMNET-T		Oak Ridge Gaseous Diffusion Plant is Corporate Author, TRADOC Analysis Command (AD - B147354 and AD - B147355)					1990	Verification, Validation		From Old DMSO VV&A Bibliography: V&V of a postion of the SIMNET-Training

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			Verification and Validation Repository of Conferences about V&V of Expert Systesm	Accessed at http://www.bus.miami.edu/~rplant/vandv.html#workshops on 25 Feb 2002							V&V, Expert Systems	Useful references	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
			Verification, Validation, and Accreditation (VV&A) Automated Support Tools: A State of the Art Report		Modeling and Simulation Information Analysis Center (MSIAC); accessible from http://www.msiac.dmso.mil					36875	VV&A, automated, tools	A compendium and an analysis of COTS, GOTS, and developmental automated tools for VV&A of individual M&S or systems of M&S.	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
			Verification, Validation, and Accreditation (VV&A) Plan for Global Protection Against Limited Strikes (GPALS) Integrated System Test Capability (Strawman for Developmental Testing Use)		SDIO Test and Evaluation Directorate					1993			From Old DMSO VV&A Bibliography: Replaces Entry #170
				Guidelines for Evaluating and Expressing the Unvertainty of NIST Measurement Results (NIST Technical Note 1297)	National Institute of Standards and Technology (NIST), Gaithersburg, MD					Sept. 1994	uncertainty, measurement, validation	Guides for how to express measurement uncertainty; critical information for validation	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
				Test Uncertainty	American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME), New York			ASME PTC 19.1-1998 (revision of 1986 standard)		1998	uncertainty, measurement, validation	Guides for how to express measurement uncertainty; critical information for validation	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu
				Guide to the Expression of Uncertainty in Measurement	International Organization for Standardization (ISO), Geneva, Switzerland	92-67-10188-9		Corrected & reprinted version		1995	uncertainty, measurement, validation	Guides for how to express measurement uncertainty; critical information for validation	Dale K. Pace/240-228-5650/dale.pace@jhuapl.edu